

THE IRON AGE

THURSDAY, MAY 2, 1889

The Apprentice System in Germany.

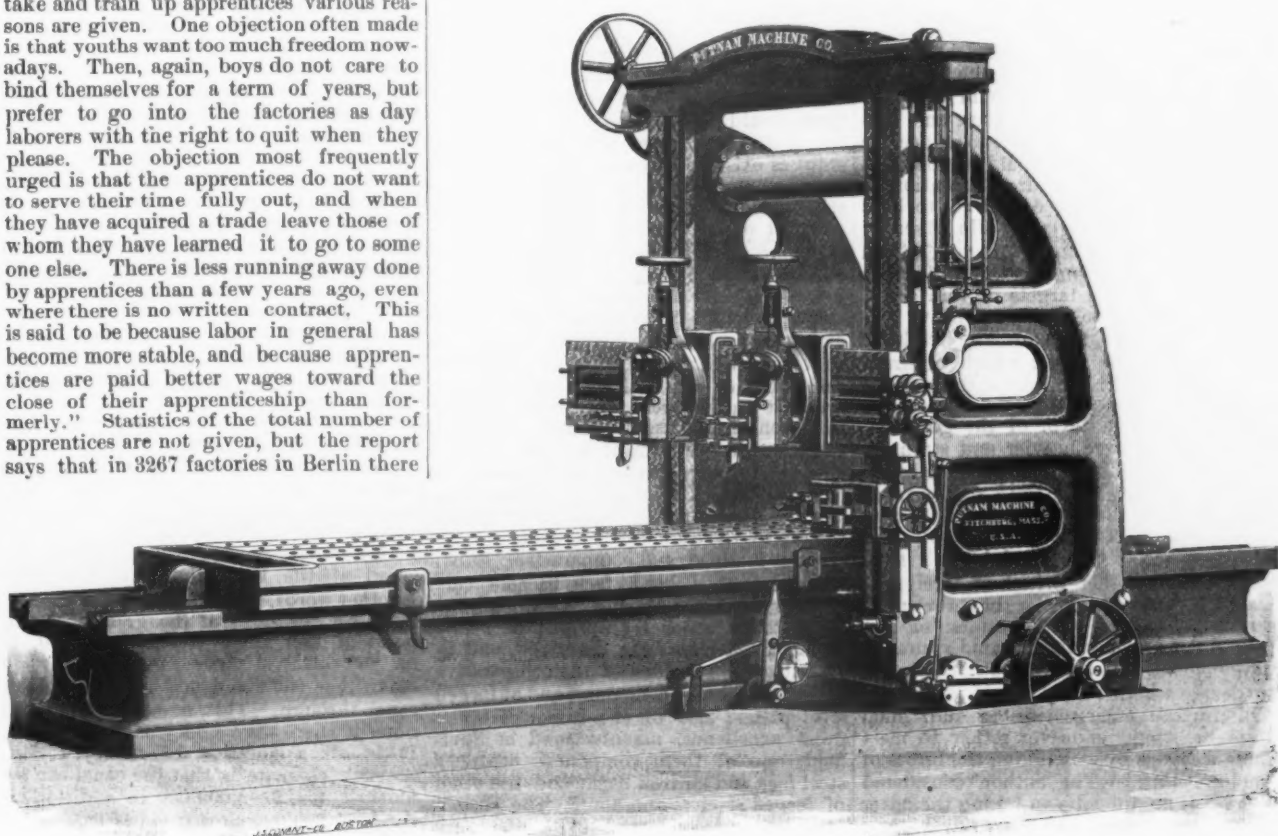
An official report from Germany on the apprentice system shows that the United States is not the only country which is troubled to know what to do with its boys. There, as here, boys prefer the liberty and comparatively good wages of an unskilled laborer to the self-sacrifice necessary to become skilled artisans. A report received by the Department of State from Commercial Agent Smith, of Mayence, on "Factory Operatives and Apprentices in Germany," says: "There is but slight disposition among manufacturers to provide themselves with skilled laborers by training up apprentices. For this disinclination on the part of manufacturers to take and train up apprentices various reasons are given. One objection often made is that youths want too much freedom nowadays. Then, again, boys do not care to bind themselves for a term of years, but prefer to go into the factories as day laborers with the right to quit when they please. The objection most frequently urged is that the apprentices do not want to serve their time fully out, and when they have acquired a trade leave those of whom they have learned it to go to some one else. There is less running away done by apprentices than a few years ago, even where there is no written contract. This is said to be because labor in general has become more stable, and because apprentices are paid better wages toward the close of their apprenticeship than formerly." Statistics of the total number of apprentices are not given, but the report says that in 3267 factories in Berlin there

had become a solid mass that was removed with difficulty. The other shoes upon the truck were in the same condition. An inspection of these shoes and tires might cause those who are using steel shoes upon steel tires to reflect deeply upon the wisdom of their course.

Planing Machine, with Quick Return.

This planer is made by the Putnam Machine Company, of Fitchburg, Mass., whose New York office is at 115 Liberty street. The operating mechanism is conveniently arranged, and controls the advancing and receding movements of the table from

side heads on the posts, if desired. When two heads are used, as shown in the engraving, the cross-beam is extended so that one head can be run entirely out of the way, and the other permitted to have the full working range of the machine. Each head slide has a traverse of 12 inches, and has hand and power independent horizontal, vertical and angular feeds. The post heads are independent, and are operated the entire length of the post by power in either direction, besides having a quick hand adjustment. The beam, saddle, head and posts are scraped to surface plates when being fitted. The screws, rods and shafts are of steel, and the elevating screws have hardened joints and



PLANING MACHINE, WITH QUICK RETURN.—BUILT BY THE PUTNAM MACHINE COMPANY.

are 4970 apprentices. This is 66 apprentices to every 1000 workmen; too small a number, the inspector of the district thinks, to supply the bosses, foremen and skilled workmen needed. The general report of the inspectors is that the apprentices are not employed in too great proportion to adult workmen, except in some particular branches of industry and by small establishments, where a good deal of hand labor is used. Complaints, however, of the employment of too large a number of apprentices are noted from various districts.

That the use of steel brake shoes upon steel tires does not produce good results has been demonstrated by the experience of many who have given them a trial. The editor of the *Railway Review* states that he recently saw an irregular lump of steel formed by the cuttings occasioned by the use of steel shoes. These cuttings from the tire had lodged in the recess of the shoe, which was of the Ross type, and

either side of the machine, which has hand and automatic horizontal, vertical and angular feeds, universal feed in the head and extra-coarse surfacing feed. The motive parts consist of large, triple-powered steel shafts, with strong and accurately-cut gears. The rack-pinion is made from a solid steel forged blank. The pulley-pinion is made of rawhide, which, together with a well-proportioned and carefully-built train of gearing, imparts a smooth and lasting motion to the table, which reverses without shock or jar. The beam has a vertical range of 61½ inches, and can be fed (under cut) up or down the entire distance, besides having an automatic quick motion for adjustment to position. The belts are operated by an improved automatic shifter, which acts upon the loose pulley in advance of the other, thereby preventing the excessive wear of the belts and producing little or no noise in reversing.

The machine may be provided with two heads upon the cross-beam, and also with

adjustable steel steps to preserve the original accuracy of the beam. The table is heavy, well ribbed and has pockets at each end. The bed is massive and thoroughly braced, has oil pockets at each end of the ways; also cone disk oil reservoirs, which automatically lubricate the table. Between the housings the bed is made double on each side and arched over, making it extremely stiff at the point of greatest strain. The machine is made in 10, 12, 14, 16, 18, 20, 22 and 24 feet lengths of table.

The Reading Railroad Company are making heavy additions to their freight equipment, particularly for use of the coal and iron department. The Iron Car Company, of New York, are building 640 freight cars and 888 coal cars of the drop-bottom pattern. The Harrisburg Car Company are building 1821 cars, and the refrigerator car equipment is to be increased by 50 cars of the Weeks patent.

Armor for Ships.

At the twenty-first ordinary meeting of the session of the Institution of Civil Engineers, held on Tuesday, April 9, Sir George B. Bruce, the president, being in the chair, the paper read was on "Armor for Ships," by Sir Nathaniel Barnaby, K.C.B. The author described and illustrated by drawings the applications of armor to ships in the French Navy between 1858 and 1888. He directed attention to the increasing thickness of armor to meet the growth in the gun, to the corresponding reduction in the area of surface covered, and to the eventual disuse of side armor for protecting the batteries. Thereupon the development of quick-firing shell guns was rapidly extended, and high explosives, such as gun-cotton, melinite, belite, lyddite, &c., were introduced, and were being perfected as bursting charges for shells. On the assumption that thin armor was and would remain effective against such projectiles, armor of 4 and 5 inches in thickness was again being demanded by sailors for the defense of the sides of the ship in front of the batteries. Believing that such armor would be costly, ineffective and even dangerous, and that it would tend more than ever to reduce the number of ships which could be brought into action, the author drew attention at the outset to what he conceived to be a wrong policy for England. He observed it was certain that, apart altogether from these quick-firing guns, it would only be necessary to put up targets of thin armor and expose them to the fire of heavy projectiles in order to show the frightful wreck behind the target which occurred years ago, and which led to thicker and ever thicker armor. But there would be this difference in favor of the gun, that the projectiles were heavier and stronger, the velocities higher and the explosives more powerful. He showed that without going beyond the ships now building an expenditure of \$5,000,000 per ship had been reached. On examining all such large ships, whether British or foreign, it would be discovered that they were most seriously exposed to the attack of the powerful weapons now in rapid course of development. The naval authorities had to decide whether they would concur in still further enlargement in individual ships or would endeavor rather to meet these weapons by combining the forces of smaller ships. The author considered there was no difficulty in taking the latter course, and that it had many advantages. The principle of subdivision was consistent with perfect seaworthiness, with speed as high as that of the largest ships, with the control of weapons which could be used with fatal effect upon the most powerful ships of the enemy, and with such powers of endurance as would enable the smaller vessels to receive injuries from the largest ships without necessarily fatal results. If it should be said that this dispersion of force entailed a risk of destruction in detail, by encounters with units of greater force in the hands of an enemy, that argument simply went to show that organizing skill would be required to insure the presence of the united forces where they were needed.

Referring to the concentration of material value in a few ships, thus preventing the construction of many ships, he remarked that in the line-of-battle ship of 50 years ago the value of the material for a single command was about \$500,000, and the value per man in the crews of such ships not more than \$750. In the iron-clad of 12,000 tons to-day the value of ten of the former line-of-battle ships was intrusted to each captain, and not less than \$10,000 to each man in the crew. In order to put forward, in a concrete form, his view as to the type of fighting ship most

suitable for the present needs of the British Navy, he had brought forward a design. It was for a ship of 3200 tons displacement, costing one-fourth of the so-called first-class battle-ship of to-day. A sufficient number of ships of this type could probably be built and armed in two years. It might be said that nothing could be done upon such dimensions and at such cost to entitle the ship to be called a battle-ship. But the 74-gun line-of-battle ship of 50 years ago had only a total displacement of 3000 tons, and the 80-gun ship of the same period 3500 tons. This design came between the two, and would only cost as much as three 74-gun ships. If the British Government determined to spend money upon invulnerable ships, the difficulty of getting enough ships would be perpetually growing. There was no obstacle, except in finding the money, to making an invulnerable ship. Ships could be built and navigated which no torpedo or ram or gun that could be worked from any ship now in existence could fatally wound. In such a ship every man might be absolutely protected, high explosives notwithstanding. But there would be so few of them that commerce and the colonies might be lost for want of ships, and there would only be the satisfaction that the sailors had been protected in such ships as existed. The question was, Ought England at the present moment to move still further onward in increasing the size and cost of heavily-armored ships requiring four or five years to complete? Or ought this country rather to endeavor to increase rapidly the number of protected ships, capable, by reason of their speed and armament, of taking part in any engagement with an enemy, however powerful? In this exposition of the uses of armor it was apparent that fighting ships must continue to use it. When armor was employed in the form of a comparatively thin horizontal plating experiment seemed to have shown that steel low in carbon was the best material. When it was employed in the form of a wall, either upright or inclined, and comparatively thick, the value of a hard face became very marked. The various modes of manufacturing thick armor for upright, or nearly upright, defenses were described, and illustrations were given of the comparative resisting power of compound and of forged steel plates; also of two armor-plates of great excellence, manufactured at Sheffield, one of them compound, having a steel face and an iron back, and the other of forged steel throughout. The superiority of the compound plate was very marked.

The author also drew attention to the improvement effected by the use of the hydraulic press in the manufacture of thick armor-plates. To many minds it seemed that the hope of the future for peaceful sea traders lay rather in abasing than in increasing the individual superiority of the special ship of war. No efforts should be spared to raise the character and strength of the fast mercantile ships. But it must be admitted that there was no prospect of a diminution in the use of armor in regular fighting ships. The evident tendency was toward its introduction into every fighting ship. Referring to the aspect of the question from the side of the attack, the author remarked that when the large unarmored structures in the French ships were considered, the seriousness of the new attack became evident. And it was the artilleryman who must be first impressed. It was of more consequence to be able to inflict damage in action than to be able to avoid it. The best defence was to be found in a vigorous attack. It must be understood that the powerful ships in modern navies were not protected, so far as their batteries were concerned, by the armor which the French thought necessary. They were unarmored from their lower

decks upward. The author asked: Was full advantage to be taken in the British Navy of these high explosives in any war which might break out within the next two or three years? Writing before the Government proposals had become known to him, he would agree cheerfully to any suggestions by the Government as to the size of the new ships and as to the use of armor for them if they were laid for approval before some competent technical committee for a month.

The Work at Panama.

The principal engineering difficulty encountered in excavating for the Panama Canal is well described by H. B. Slaven, president of the American Dredging Company, who built successfully 15 miles of canal on the Colon side, covered by their contract. He says: "The Culebra cut is the sticking point. Into it the company have poured money like water. There are no finer engineers in the world than the French, give them a road to make or a bridge to build where they can have the bureau system developed to the utmost and where there are about seven chiefs and sub-chiefs to each man at work. They require, too, a machine shop next door all the time. But they can't work in this country, or at least on the Isthmus. They are stifled by their red tape. Where an American cannot go straight he will go round or climb over or crawl under an obstacle. The Frenchman must go through it, and that according to the original plans as signed by the chief engineer and 14 subordinates. Now, the highest point of the Culebra cut is over 300 feet above the sea. If you stuck Trinity Church steeple in it you would have to look down about 100 feet to see it. The French engineers calculated the slope at which they thought the sides of the cut ought to stand firm, and they reckoned that 10,000,000 c.m. of earth would have to be taken out. Unfortunately for them the earth refused to stand at the angle they said it would. In other words, they did not allow enough slope for the sides of the great cut. In point of fact there were 20,000,000 c. m. of earth to take out in order to make that cut stand and run a tide-level canal through. This, of course, could be done if there were money enough put up. It is all a question of money." Mr. Sloven's estimate is that the canal can be finished for \$200,000,000 in addition to the \$250,000,000 already expended.

The Philadelphia (Westinghouse) National Gas Company, of Pittsburgh, have for some time been putting gas meters into workshops and mills where the consumption of fuel has not exceeded the measuring capacity of the largest meters. Heretofore it has been practically optional with manufacturers, but recently the Philadelphia Company determined upon compulsion. This action was taken to prevent the wasting of gas, which has been going on since its introduction into Pittsburgh. Within a short time it is expected that the company will have a meter of sufficient size to measure the consumption of gas at the largest mills in Pittsburgh.

A vein of copper ore, 10 to 12 feet in width, has been discovered in Duluth while excavating for the Masonic Temple, and will probably be worked just outside the city limits.

A dozen cotton-seed oil mills, to cost \$1,000,000 or more, are in course of erection throughout the South, and to a certain extent are in competition with the Northern hog.

Speed Regulator.

The accompanying engravings, for which and the description we are indebted to *Industries*, represent a speed regulator which is being placed on the market by James Williams, of Manchester, England: "The novel part of the apparatus consists of a two-armed lever, with a central boss bored to fit the governor rocking shaft A, upon which it is fastened. At the end of each arm is a cylindrical vessel, into which

Such is a brief description of this apparatus, and a few words may now be said about the principle of its action. Suppose, for instance, that, as shown in Fig. 2, the governor balls are low, the mercury has run from the right to the left hand vessel and is consequently exercising a torsional strain on the rocking shaft in that direction. If, however, the sleeve of the governor is raised by reason of the increase of speed, the rocking shaft will be rotated by means of the fork, and the

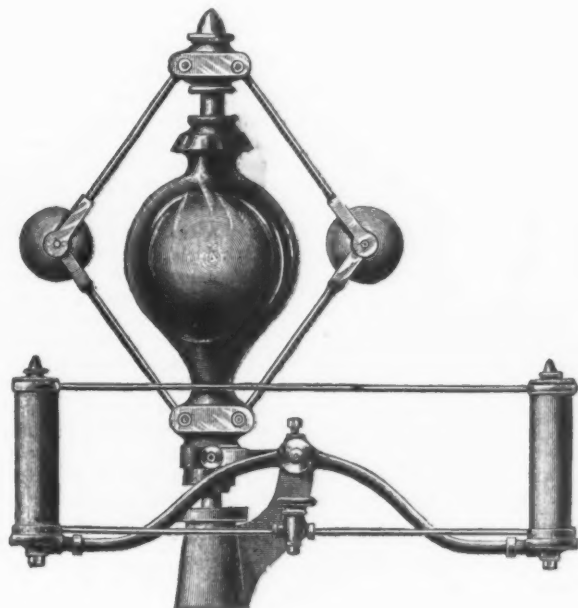


Fig. 1.

HIGGINSON'S SPEED REGULATOR.

a definite weight of mercury is introduced. These vessels are connected at the lower ends by means of a small tube, in the center of which is a tap, and at their upper ends by another tube. The latter enables the vessels to be made air-tight, and constitutes a means by which an air communication is made between them. It will be

position of the two vessels would be reversed. In this case the shaft would be helped to make a movement in a new direction, which is equivalent to the removal of a certain weight from the governor. The provision of the small tap in the mercury tube prevents this removal or accretion of weight taking place too rapidly, and so avoids anything like hunting of the engine. It may occur that in order to preserve the isochronism of the governor it is necessary to add a greater weight when it is at its lowest position than is removed when it is assuming the higher. It that case taper filling pieces of iron are introduced into the vessels, and made of such a size and so fitted that at all positions of the vessels the required weight is added. It will be understood that the amount of mercury used will vary with the construction and size of the governor dealt with. The apparatus is quite self-contained, and only requires fixing on the rocking shaft to be ready for action. The regulator is simple, of small first cost and should be practically undamageable. Electrical engineers especially may find in this regulator a ready means of correcting the speed of the engines used by them, while it does not involve any supplementary driving or excessive complication.

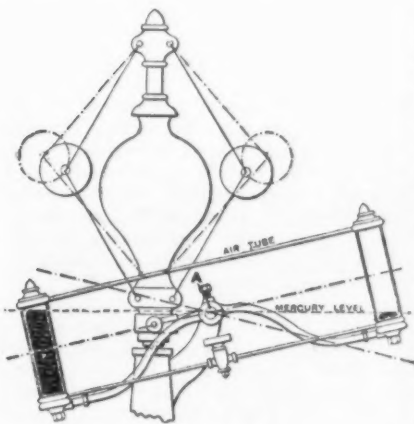


Fig. 2.

obvious that so long as the two vessels are in the same horizontal plane the level of the mercury in each will be alike; while if one is raised above the other, as shown in Fig. 2, the mercury will flow along the lower tube into the depressed vessel until the surfaces are again level, and by adjusting the tap shown the speed of this flow can be regulated. At the same time that the mercury is leaving the one vessel and passing into the other, the air contained above it can also pass by the upper tube, and the balance is thus maintained."

As the result of the work done by the Michigan Stove Company, of Detroit, in testing and applying aluminium additions to iron in making castings, they were the recipients of many letters containing inquiries, &c. They have made arrangements with a producer of aluminium who makes about 50 pounds per day to supply the metal to purchasers at \$5 per pound. The quality of the metal has steadily improved. One of the first lots contained 95.5 per cent. aluminium, 1.02 silicon and 2.88 iron. Another lot showed by analysis

96.35 per cent. of aluminium, 2.16 per cent. of silver, 1.47 per cent. of iron and 0.02 of copper. A few days since a 50-pound lot just received carried 98.34 of aluminium, 1.34 silicon and 0.32 iron. At first considerable trouble was experienced in endeavoring to roll the metal, but now it is rolled to any thickness. The Michigan Stove Company have recently received some foil, and also a quantity rolled to No. 8 Brown & Sharp gauge. They are ready to supply it from $\frac{1}{8}$ inch down. They attain good results down to 0.005 inch in plates 9 inches wide. The Michigan Stove Company certainly deserve credit for the energy which they have displayed in this matter. They have done more than any one to bring the properties of aluminium into public notice, and are instrumental in bringing the price down to a point where the metal can come into general use.

Our Trade with China.

The delay on the part of the President in the appointment of a Minister to China is said to be due to a desire of the Administration to select for the office not only a good diplomat, but a man who will be likely to exert influence in the development of trade between China and the United States. Our trade with China has not varied much in aggregate value during the last ten years, but the exports from the United States to China have been gradually increasing since 1870. In 1878 the total value of imports and exports of merchandise was \$24,987,738; in 1888 it was \$26,061,000. In seven out of these ten years, however, the total commerce exceeded the figure for the last year. This figure was also exceeded in 1872 and 1873. The exports in 1870 were valued at \$3,116,381; in 1878 they were \$6,867,255, and in 1888, \$7,926,000. The year of largest exports was 1886, when they amounted to \$11,576,817. Our exports to China during the last fiscal year were less than they have been in seven years, with the exception of 1884. Our imports from China were less than for eight years, with the exception of 1884 and 1885. Our imports from China are chiefly tea, raw silk, hides and skins, materials for hats and bonnets, furs and rice. Our exports are principally cotton cloths and illuminating oils. We sent \$5,181,050 worth of cotton goods to China alone in 1887, and in 1888 \$3,128,771 worth. For the first eight months of the present fiscal year our exports of cotton cloths, so far as shown by Government statistics, were only \$823,808, as compared with \$2,096,347 for the first eight months of 1888. This would seem to indicate that the result of the hasty action of Congress early last autumn in passing the Chinese Exclusion bill had been to diminish the demand from China for our goods. This tendency is shown also in the exports of mineral oils.

The commerce of the United States with China in 1886 (one of the greatest years) was estimated at only 8 per cent. of the entire foreign commerce of that country, while that of Great Britain was estimated at 75 per cent. The geographical position of the United States gives them commercial advantages over Great Britain and over most other countries in the securing of Chinese trade, and when the importance of the country's resources are considered, the necessity for maintaining cordial official relations between the Government of China and our own is more thoroughly appreciated. The figures given above showing the decrease in our exports thither since last June seem to make a very pointed moral to Congressional mischief-making for political ends, and ought to be sufficient warning for the future.

Facing Machine.

We have previously illustrated several tools of a new system for finishing bolts and nuts. In our issue of September 22, 1887, we described a machine for finishing the sides of bolt-heads and nuts called a

ing it in position. A long hole through the spindle permits the placing of a bolt 20 inches in length. The bolts are held by universal chucks. For nuts the rack-ring is used, which insures true dressing in relation to the axis, and which at the same time admits of a loose fit on the

the plunger, and the work must, of necessity, be uniform as long as the two spindles remain duplicates, as the distance traveled by the plunger at each stroke is always the same. This machine is built by Nicholson & Waterman, of Providence, R. I.

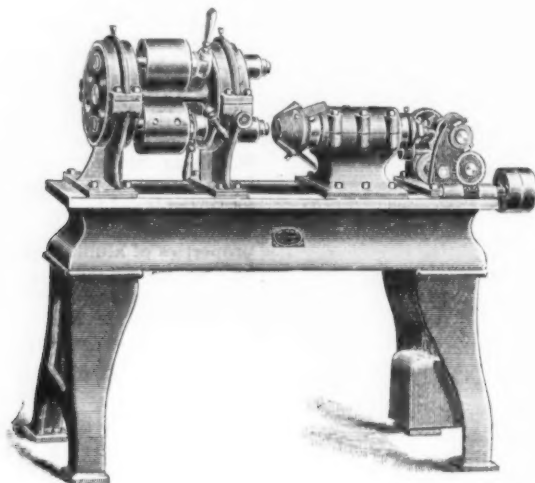


Fig. 1.

THE NICHOLSON FACING MACHINE.

broaching and milling machine. In this issue we show the perfected companion tool—one for dressing the top and bottom of nuts and the top of bolt-heads. The work done by this machine is the finishing of the tops uniformly, as a matter of taste, and the dressing of the bottom true with the axis of the thread, at the same time relieving the corners and chamfering the first thread. At one end of the table is the cutter-holder and its driving mechanism, and at the other end the spindles for carrying the nuts or bolts to be dressed. Two spindles, duplicates of each other, are

thread of the spindle, a most important item in rapidly removing and replacing nuts.

The movement of the cutter-head is governed by a cam and weight. The cam is made to advance gradually and recede

The Bookwalter or Robert process for the manufacture of steel is likely to be very thoroughly tested in the West this year. The Michigan Steel Company, of Detroit, are rapidly pushing work on their plant, which they hope to have in operation early in June. The machinery is being built by the Morgan Engineering Company, of Alliance, Ohio. The steel to be turned out by these works will be of a special quality for springs to be manufactured by the Detroit Steel and Spring Works. At Chicago the Fowler Steel Car-wheel Company have their buildings erected for the steel works, and will be prepared at an early day to put in the machinery, which they expect to start up in July. Their plant will make steel castings in the form of wheel-blanks for their rolling machine. The plans which have been prepared for these works show a remarkably compact and convenient arrangement of the several departments, which is worthy of extended description. Another steel plant on this system is projected near Chicago, but negotiations with the owners of the patents have not yet been completed. If this plant is built it will make a dead soft steel to take the place of highly refined iron in the manufacture of a specialty. A peculiar characteristic of the Robert steel, which was noted by a very practical engineer who spent some time in investigating the process at Springfield, Ohio, is the

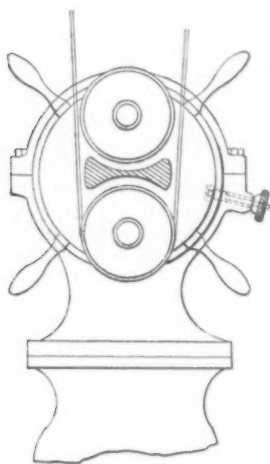


Fig. 2.—Cross Section of Spindles.

placed one above the other, and as the driving pulley on the counter-shaft is larger than those on the spindles, the upper spindle always remains stationary. This enables the operator to remove and replace the work, while at the same time a plunger carrying cutters advances, dresses the work and retires quickly. At this moment the operator reverses the spindles, bringing the dressed nut uppermost in position for replacing. The number of oscillations made by the cutter-holder represent faces dressed, and can be varied to suit the requirements from 1 to 4 per minute. The two spindles run in tapered hardened bearings provided with take-up for wear. The drum on the spool has handles for revolving it and hardened pins for lock-

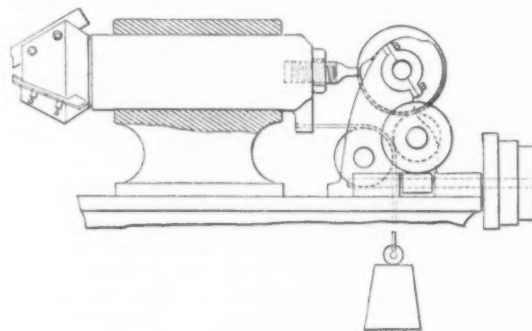


Fig. 3.—Section of Cutter-Holder.

quickly, remaining removed a sufficient time to allow the operator to reverse the spindle. The number of movements back and forth in a given time can be altered by changing the gears which connect the cam-shaft with the shaft carrying the worm gear. Power is furnished by a

difference of hardness between it and open-hearth steel. He states, for instance, that 0.15 carbon Robert steel is as hard as 0.25 carbon open-hearth steel. This is a more decided difference than that which has been found to exist between open-hearth and Bessemer steel, less carbon contents being required in the former to equal that of the latter.

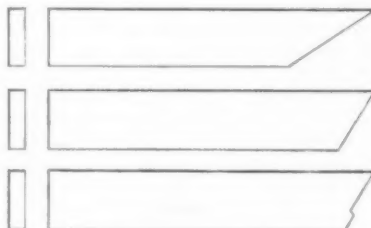


Fig. 4.—Cutting Tools.

narrow belt turning a cone on the worm shaft, which through suitable gearing drives the cam, which forces forward the plunger, carrying the cutting tools, the plunger being withdrawn by the weight arranged as shown in Fig. 3. The product of the machine is controlled by the rapidity of movement of the cam moving

A test of the edge-tools made of steel produced by the Falls City Malleable Iron and Steel Company, of Louisville, Ky., was made lately by F. R. Levering at the works of the United States Rolling Stock Company, at Anniston, Ala.

Immigration was a little heavier in 1888 than in 1887, the total number of persons entering being 525,019, against 516,933 in 1887, 392,887 in 1886 and 332,261 in 1885. This is exclusive of the overland immigration from Canada and Mexico. An analysis of the figures shows that of the immigrants 326,556 were males and 198,463 were females. Great Britain sent 173,141, of which 71,966 were from Ireland. The Germans numbered 106,975, the Swedes 48,845, the Italians 47,424, the Russians 35,504, the Austrians 25,080 and the Huns 12,856.

The Catasauqua Scrap-Iron Frauds.

Ex-Burgess Philip Storm, of Catasauqua, Pa., was lately arrested on a *capias* charging him with having assisted in defrauding the Catasauqua Mfg. Company out of \$12,862.61. A *capias* has also been issued for the arrest of John W. Hopkins, the present Burgess of Catasauqua, but he cannot be found, having disappeared several weeks ago. Hopkins was assistant superintendent of the Catasauqua Mfg. Company, and weighed the scrap-iron furnished by Storm. He made false entries, and the money paid for scrap-iron in excess of what the company actually received is alleged to have been divided by Storm and Hopkins. Storm was placed under \$13,000 bail. The amount of scrap-iron paid for and not received amounted

Leavitt Air Compressor FOR the Calumet and Hecla Mines.

The air compressor of which we herewith present drawings of some of the more prominent parts was designed by E. D. Leavitt, Jr., and built by the I. P. Morris Company for the Calumet and Hecla Mining Company. It is now located at the Hecla mine. [Figs. 1, 2, 3, 16, and 17 will be found on supplementary sheet.]

The compressor has two double-acting plungers of 42 inches diameter and 60 inches stroke, and operates upon the displacement principle, the plunger working through a central packing or bearing in a

being 8 feet deep and 36 inches wide. The compressor measures over all 40 feet 6½ inches, and the cylinders are placed 14 feet between centers. Each of the two bed-plates, the forms of which are clearly outlined in the plan and side elevation of the entire compressor, Figs. 1 and 2, is a single casting weighing, finished, 38,000 pounds. The extreme measurement of the plate is 25 feet 11½ inches. Each plate is held to the foundation by nine 3-inch bolts, distributed four at the cross-head, two at the center and three at the outer end. The jaws to receive the shaft bearings are rectangular and each measures 20½ inches deep, 26 inches long and 28 inches wide. The boxes are babbitted and formed with circular dovetailed grooves to receive and hold the babbitt. The adjustment of the bearing is accomplished by means of two wedges 28 inches wide and 12½ inches in

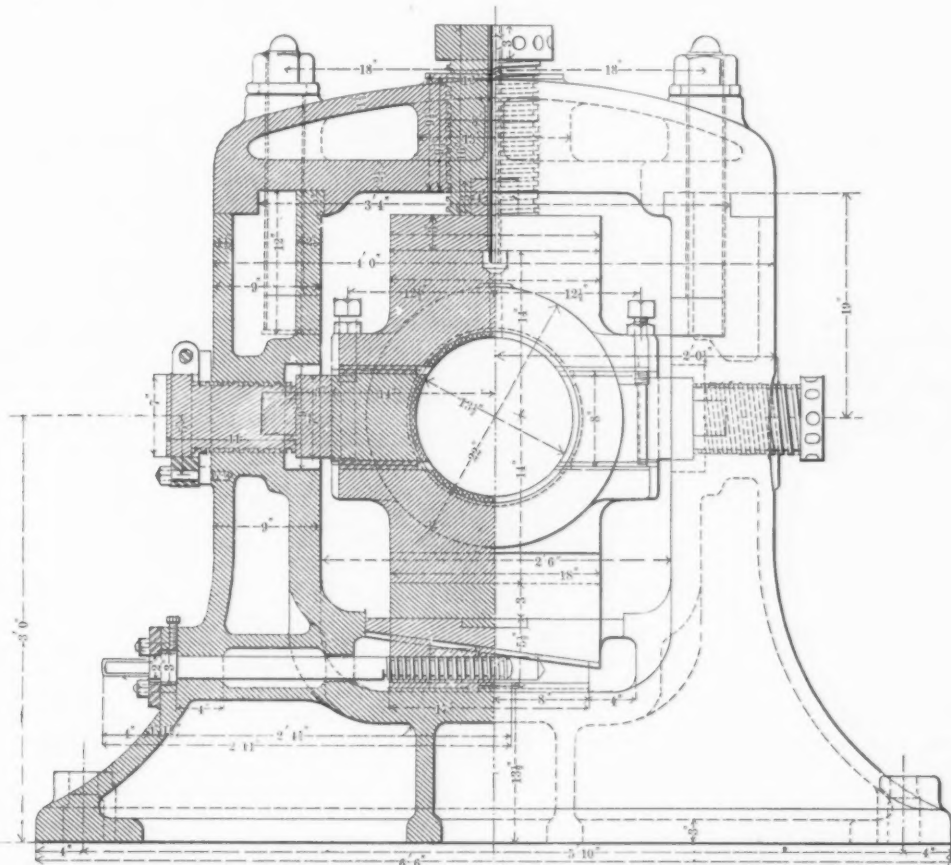


Fig. 4.—Vertical Section Adjustable Pedestal.

to 1,493,015 pounds. The fraud has been carried on since 1886.

Referring to the dispatch from Allentown, recently printed in some of the daily papers, that Oliver Williams, president of the Catasauqua Mfg. Company, had been requested to resign, we are informed by one of the directors of the company that there is not the slightest foundation for the report. Mr. Williams has been manager of the company for over 20 years, and is one of the largest stockholders. Under his management the corporation has grown to be one of the largest and most successful in the Lehigh Valley. The plant was small and insignificant when he assumed control. The company has accumulated a large reserve fund, has paid dividends regularly, and has an enviable reputation for its products. In the prosecution of the men who have defrauded the company through sales of scrap-iron, every step has been taken after consultation with the board of directors, and they are a unit in supporting Mr. Williams in the course he has adopted. He is so well known in the Eastern trade that a denial of the rumors is hardly needed by his friends.

cylinder partly filled with water. The cylinder is divided by the bearing and plunger into two compartments, each of which is partly filled with water, the quantity being such that the plunger is always entirely submerged, even when at either end of its stroke. Each movement of the plunger lowers the water in one compartment of the cylinder and raises it in the other, the water thus acting, to all intents and purposes, as an extension of the plunger. The lowering water draws in air from the atmosphere through two rows of valves encircling the dome or air receiver, and at the same time the advancing plunger forces the water in the opposite compartment upward into the valve-chest, thereby displacing the air which had been admitted during the preceding half of the stroke. Provision is made for the forcing, through many finely punctured nozzles, of water into the upper part of the valve-chest during the compression and expulsion of the air.

The foundation consists of a body of concrete upon which is built a bed of brick 13 feet 6 inches thick, 60 feet long and 33 feet 8 inches wide, the wheel-pit

height, the true movement of each of which is obtained by two square threaded screws, one of which is united to each end of the base of the wedge, which is, of course, inverted and operated from the top of the cap. Each screw carries a steel gear, between and meshing with each of which is an intermediate gear, also of steel, the teeth being cut absolutely free from backlash. It is evident that any movement of either of the main gears will raise or lower the wedge to which the screws are united, and will do this without the possibility of bringing the wedge to an uneven bearing.

The three adjustable pedestals carrying the pinion shaft are bolted to the top of the bed-plate, their center line being 14 feet 4½ inches horizontally and 4 feet 3 inches vertically from the center of the crankshaft. Their construction is shown in the drawing Fig. 4. The box consists of four parts, each of which can be adjusted independently. The top and two side parts of the bearing are moved to adjustment by means of square threaded studs, while the bottom quarter is actuated by a wedge moved by a screw and the lower surface of which is horizontal and upper surface in-

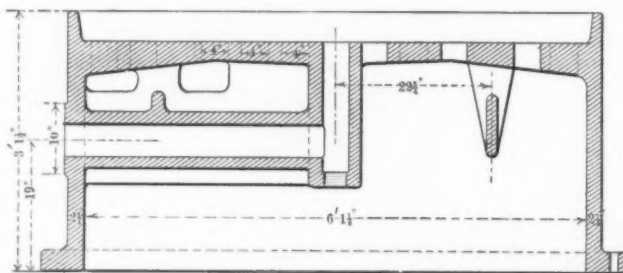
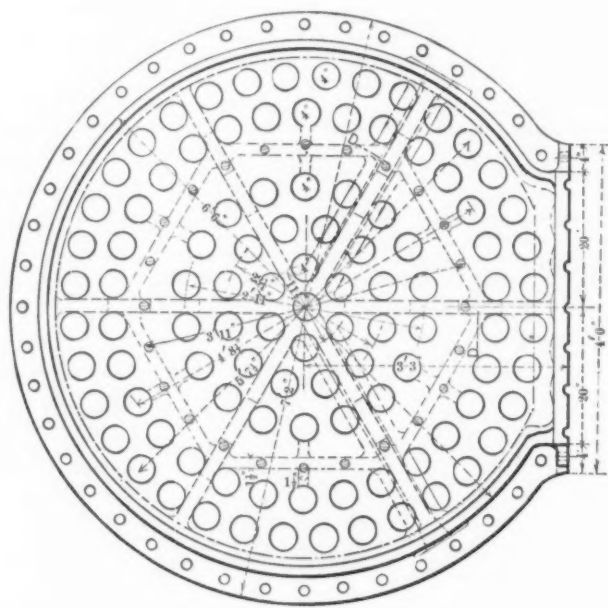
clined $1\frac{1}{2}$ inches per foot. Horizontal and vertical angular movements are provided for by the concave chocks in which the brasses rest. Accurate aligning of the three bearings of this, which is really the driving shaft, is thus obtained.

The cranks, crank pins, shafts and connecting rods are of Krupp's oil-tempered crucible steel, having an elastic limit of 45,000 pounds per square inch and an elongation of 18 per cent. in 10 inches. Each crank is 11 inches thick, 2 feet 9 inches in diameter at the shaft and 20 inches in diameter at the pin. The crank is bored $18\frac{1}{2}$ inches to fit the shaft to which it is keyed. The pin is forced into the crank, and is 10 inches in diameter and 10 inches bearing length. The crank-shaft is 13 feet 2 inches long, $16\frac{1}{2}$ inches in diameter at the bearings and 19 inches in diameter at the gear. It is made hollow, the diameter of the bore being 6 inches. The length of connecting rods between centers is 15 feet, and over all 17 feet $\frac{1}{4}$ inch. Each weighs, complete, 3860 pounds. At the cross-head the rod is 6 inches in diameter, and at the crank end $10\frac{3}{4}$ x 7 inches. The crank-end boxes are cast steel and the cross-head boxes are brass, both babbitted. The adjustment of the box in each bearing is provided for by a wedge operated by two square threaded bolts placed in line, and one entering the wedge from each side. By means of these bolts the box, through the upward or downward movement of the wedge, can be brought to the desired bearing. The cross-head gibs are of cast iron, the bodies being Eureka steel, and their surfaces are babbitted and turned to a circle 30 inches in diameter. The bearing is $2\frac{1}{2}$ feet long and 18 inches wide measured on the chord. The pin is ground in the two webs of the body, and on it is keyed a sleeve, 8 inches in diameter, to which the connecting rod-bearing fits. The inner end of each bed-plate is circular in section, 5 feet in diameter, and is flanged to receive bolt-holes and faced to fit the end of the cylinder.

Each cylinder is formed of a single casting faced at the top, ends and side to receive, respectively, the valve-chest, heads, and manhole plates. The casting is $2\frac{1}{2}$ inches thick. The plunger bearing is formed in the lower part of a wall dividing

has a diameter of $6\frac{1}{2}$ feet. The cylinder bushing is of composition and is 28 inches long. The plunger, of which we show a longitudinal section in place in the cylinder, is 42 inches in diameter outside, $7\frac{1}{2}$ feet long

being $2\frac{1}{2}$ inches thick. The top is faced to receive the valve seats, the openings for which are 4 inches in diameter. The arrangement of both the inlet and outlet valves is shown in Fig. 7, which is a plan



Figs. 7 and 8.—Plan and Vertical Section of Valve Chest.

without the heads. The shell is $\frac{1}{4}$ inch thick and is cast with 4-inch ribs at every 15 inches. The front head is formed with 12 radial ribs 1 inch thick and $16\frac{1}{2}$ inches deep. The plunger-rod is made of forged

view of the top of the valve chest, a vertical section of which is shown in Fig. 8. Thirty-six inlet valves are placed in a circle 5 feet $7\frac{1}{2}$ inches in diameter, and 30 inlet valves are placed in a circle 4 feet

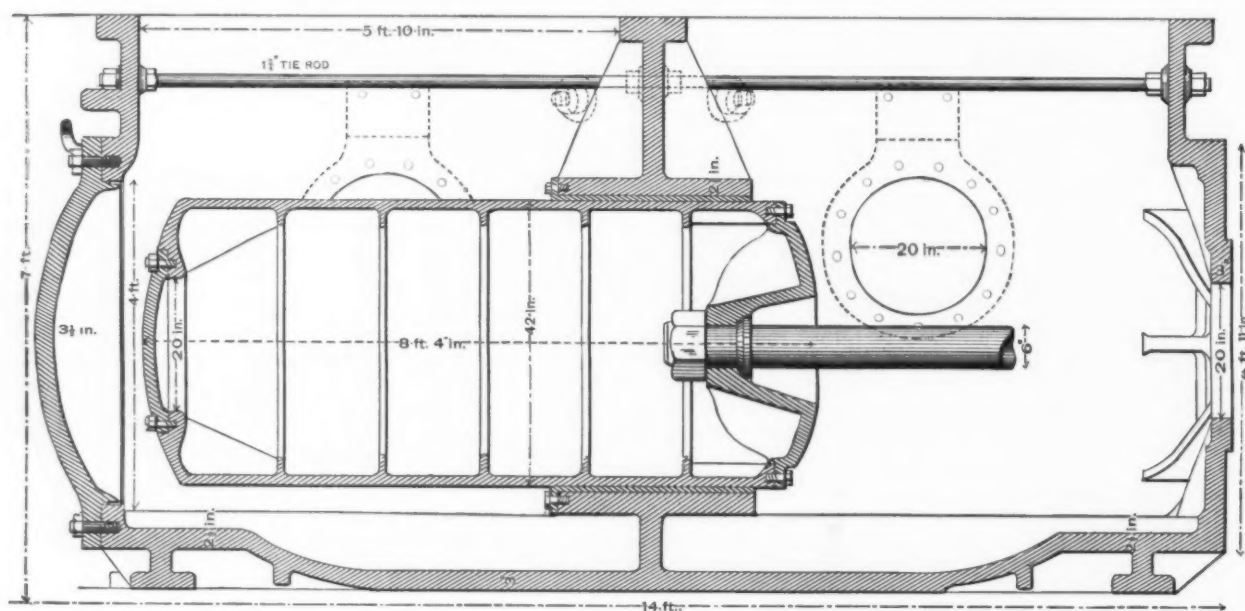


Fig. 5.—Vertical Longitudinal Section through Cylinder and Plunger.

the cylinder into two compartments. This wall is strengthened by means of ribs, as shown in the drawings of both the longitudinal and cross-section, Figs. 5 and 6.

The cylinder measures $13\frac{3}{4}$ feet over all and

crucible steel, 6 inches in diameter and 8 feet $8\frac{1}{2}$ inches long over all.

The valve chest for each cylinder is circular in plan, 6 feet $1\frac{1}{2}$ inches in diameter inside and 3 feet $1\frac{1}{2}$ inches in height, the sides

$8\frac{1}{2}$ inches in diameter, these two circles being outside the air receivers. Within each air receiver are 18 delivery valves in a circle 2 feet 11 inches in diameter, 12 in a circle $23\frac{1}{2}$ inches in diameter and 6 in a

circle 11½ inches in diameter. Each receiver is 3 feet 8 inches in diameter, and is held to the valve seat by 1½-inch bolts passing through a flange located between

of inlet-valves. On its return the plunger displaces and thereby raises the water in the cylinder, which forces the air which had been drawn from the atmosphere up

principle as the compressor—namely, a plunger working in a circular packing in a cylinder and operating by displacement—is so arranged as to deliver water to the nozzles in that chest from which the air is passing to the air receiver, the vast number of small holes in the nozzles insuring the perfect and thorough distribution of water to all parts of the chest.

The practice of injecting water into the cylinder at each stroke in order to absorb the heat created by the compression has been discarded by some of the manufacturers of air compressors, who claim that the air, from the compressor to the machine operated, should be kept as dry and free from moisture as possible in order to prevent freezing of water at the exhaust ports. The spray injection was, therefore, condemned as the direct cause of much needless trouble. A second objection was also brought forward—a mechanical one—that the presence of water in the cylinder prevented the proper lubrication of the piston, and quick wearing of the parts resulted.

It will be observed that in the compressor we are describing a most perfect and thorough system of water injection has been provided, and that seemingly an attempt has been made to saturate the air with moisture. The plunger is completely submerged at all times. And yet this same compressor has shown no signs of un-

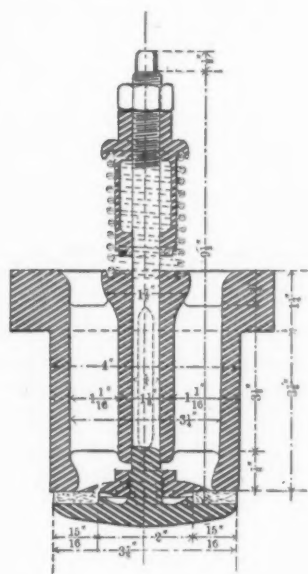


Fig. 9.—Inlet Valve.

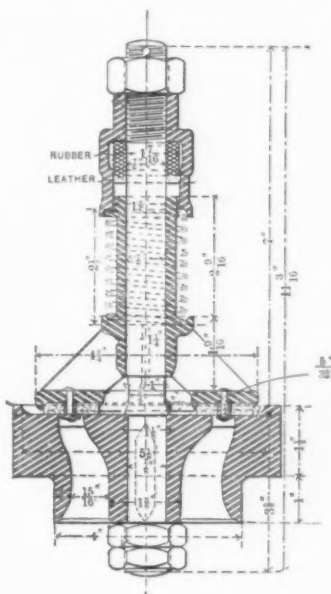
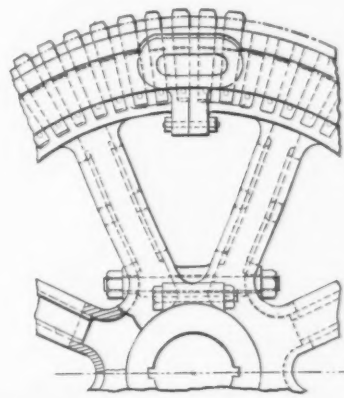
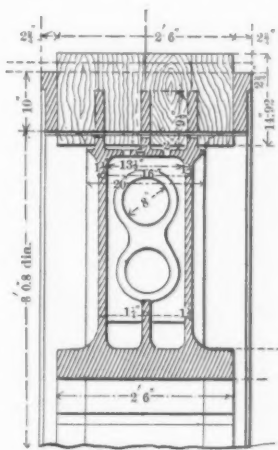


Fig. 10.—Delivery Valve.

the inlet and outlet circles of valves. Each pair of receivers is connected by a pipe, half of which is cast with each receiver, and from each pair leads a 16-inch cast-iron delivery-pipe.

The valves are shown in the drawings Figs. 9 and 10.

The injection piping in each valve chest is placed beneath the valve seats, and consists of two hexagonal rows of brass pipes, as shown in the plan Fig. 11, the inner row being of $\frac{1}{4}$ -inch pipe and the outer of 2-inch. On the smaller piping are placed six rose nozzles and on the outer 12, each nozzle being drilled with 55 holes $\frac{1}{8}$ inch in diameter. A section and development of the nozzle are shown in Fig. 13. The nozzles are supplied with water by a pump having a bore of 7 inches and a stroke of 12 inches, located one at each inner side of each cylinder, and operated by an eccentric on the crank-shaft. Provision is made for draining the air re-



Figs. 14 and 15.—Mortise Pinion.

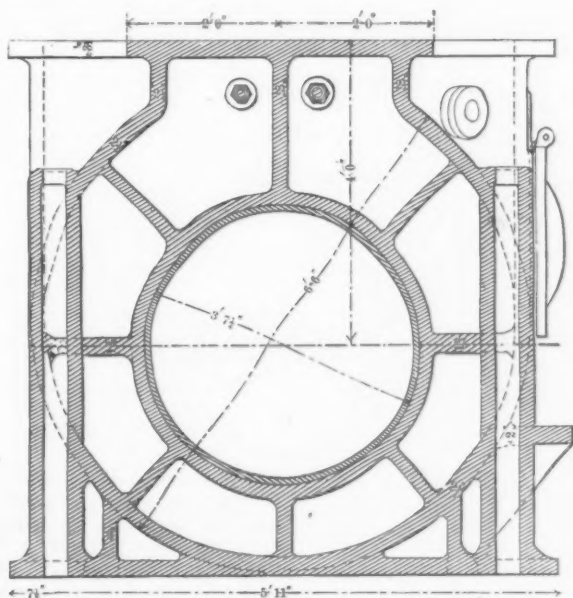


Fig. 6.—Cross Section through Center of Cylinder.

ceivers through properly arranged piping. From the foregoing the action of the compressor will be readily understood. The advancing plunger draws the air into the valve chest through the two outer rows

through the delivery-valves into the air receiver, the same action taking place, but alternately, in the other end of the cylinder. The stroke of the pump, which is constructed to operate upon the same

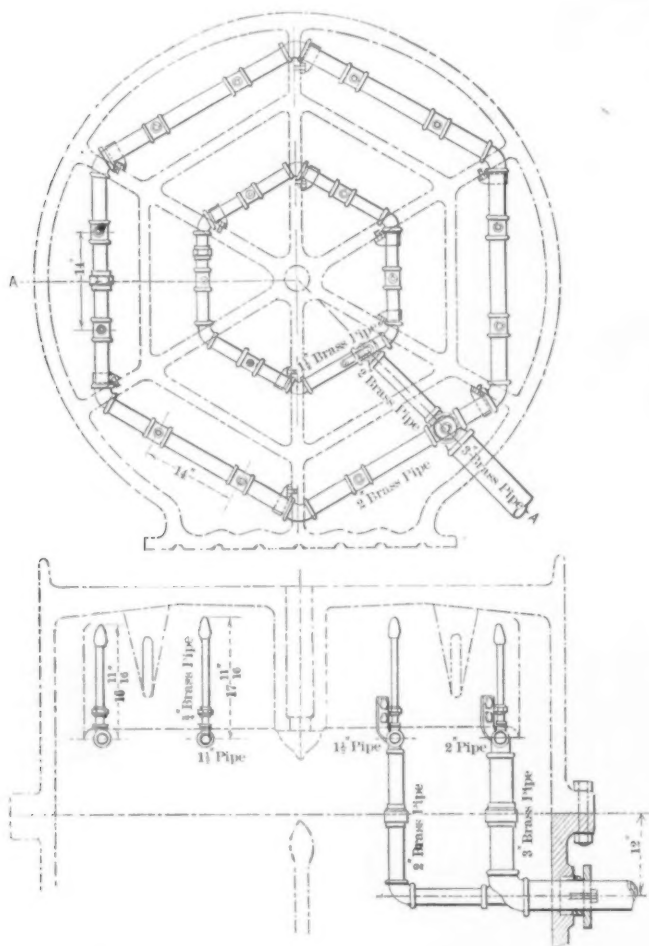
usual wear, and no trouble whatever has resulted from the condensation and freezing of vapor at the exhaust ports of the drills.*

The compressor is driven through the pinion-shaft by the compound engine Frontenac, which also drives a duplicate compressor and a Rand compressor with cylinders 28 inches diameter by 48 inches stroke.

The pinion, Figs. 14 and 15, is 10 feet in pitch diameter, 30 inches face and is cast in two segments, each of four arms. The arms are rectangular in section, with rounded corners, 8 x 16 inches, the former measurement being in the plane of the wheel. The sides of the arms are $1\frac{1}{2}$ inches thick, and with the plane are $2\frac{1}{4}$ inches thick. The rim is cast with four rectangular grooves 12 inches deep and $6\frac{1}{2}$ inches wide, each being formed by two outer and three inner flanges. The 80 teeth are of the best quality of young hickory thoroughly seasoned. The meeting surfaces of the two segments are faced and united by four 2-inch and two $2\frac{1}{4}$ -inch bolts at the hub, placed as shown in the drawing, and $1\frac{1}{2}$ -inch bolts through flanges at the rim. Over lateral lugs at the sides of the rim at the joint are shrunk wrought-iron yokes. The weight of the wheel complete is 28,000 pounds. The spur gear, Figs. 16 and 17, has a pitch diameter of 20 feet, 30 inches face, 160 cut teeth and is cast in eight segments. The outer ends of the segments

are faced, flanged and held by four 2-inch bolts. The arms are hollow, $2\frac{1}{4}$ inches thick in the plane of the wheel and $1\frac{1}{4}$ inches thick at the sides. Where the spoke, which is elliptical in section, joins the rim, its dimensions outside are 13 inches \times 8 $\frac{1}{2}$ inches, and at the hub 15 \times 10

of bronze alloy, containing 10 per cent., 1 pound of which would be 10/6, and the other 9 pounds of copper at market price, say 9d per pound, and in the ferro aluminium costs 12/6 per pound, and no charge for the iron. The ferro-aluminium ranges from 10 to 18 per cent. aluminium.



Figs. 11 and 12.—Plan and Vertical Section of Valve Chest, Showing Injection Piping.

inches. The inner end of the arm is turned to form a tenon 8 inches in diameter at its inner end and 10 inches at its outer portion. This tenon fits in a bored mortise in the center. The arm widens above the tenon and is faced to accurately fit the center, to which it is held by four $1\frac{1}{4}$ -inch bolts. It is further secured by a wrought-iron key extending transversely. The center has eight faced sides to receive the arms and is $5\frac{1}{4}$ feet in diameter. After the hub had been forced on the crank-shaft by a pressure of 200 tons, two wrought-iron bands were shrunk on recesses turned in the outer ends of the hub.

Aluminium Alloys

In an address delivered by Charles Wood, as president, before the Cleveland Institution of Engineers, the following reference is made to aluminium alloys:

Aluminium brass, in consequence of its toughness, rigidity and strength, is sure to come into use; the specific gravity being only 7.6, makes it cheap at £108 per ton. The ordinary brass will carry about 40 tons with 9 per cent. elastic limit, and is being largely used by the American Government for propellers, hydraulic work, pinions, &c. A special mixture has been tried on the London tramcar bearings with excellent results. Another interesting feature is that the bronze will stand high temperature without loss of strength. The electric furnace aluminium copper alloy is sold at 10/6 per pound of aluminium guaranteed by analysis, and the copper at market price—that is, if we take 10 pounds

As in copper, the direct addition of pure aluminium to iron and steel is a great loss; it floats on the top of the molten metal and passes off with the slag, and it will be at once seen that the ferro-aluminium pos-

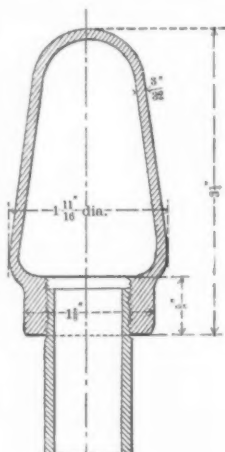


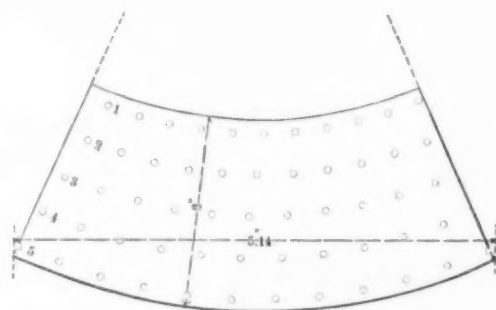
Fig. 13.—Injection Rose.

sesses a great advantage, as it amalgamates immediately without loss. A new process has within a month been brought out by Messrs. Brin Brothers, of London, who mix a rich clay with a flux into a paste, and charge this in alternate layers with thin cast-iron scrap into a cupola; the iron, when melted, is run out into a ladle

and cast in the usual way, when the iron is found to have taken up 1.75 per cent. of aluminium. The castings are exceedingly sonorous, have a white fracture and are quite free from blow-holes.

We have also the Castner process at work at Oldbury, producing from 400 to 500 pounds of pure aluminium per day. This system is entirely different from those already described, and depends (1) upon the cheap manufacture of sodium, (2) on the manufacture of a double chloride of sodium and aluminium, and (3) on the manufacture of pure aluminium. The success of the Castner process lies in the fact that by a new process the cost of sodium has been reduced from 4/ to 1/ per pound, and of aluminium from 60/ to less than 20/. The aluminium is produced in pigs of 4 pounds weight; the same size of bar in bronze, containing 90 per cent. of copper and 10 per cent. of aluminium, would weigh 12 pounds. With sodium at this low cost, it is said that not only are we to have aluminium cheap, but also magnesium, silicon and boron, and we may then lookout for more new alloys. Pure cast aluminium has a density of 2.56, forged 2.67, or only one-third that of forged steel. It melts at about 1300° F., and is the best conductor of heat and electricity known, and practically is inoxidizable even at high temperatures. Aluminium silver, composed of aluminium, copper and nickel, makes excellent cutlery, will take an edge like steel, cuts the hardest wood and does not require electroplating. A new alloy, with 10 per cent. of tin and aluminium, has nearly the same density as pure aluminium, and can be used as a solder, will take a fine polish and not tarnish. It will be seen what rapid strides the manufacture of this most interesting metal is making. That there is room for all that can be made is evident from the numerous applications I have mentioned, and that the most successful should be in the shape of an alloy rather than a pure state seems strange.

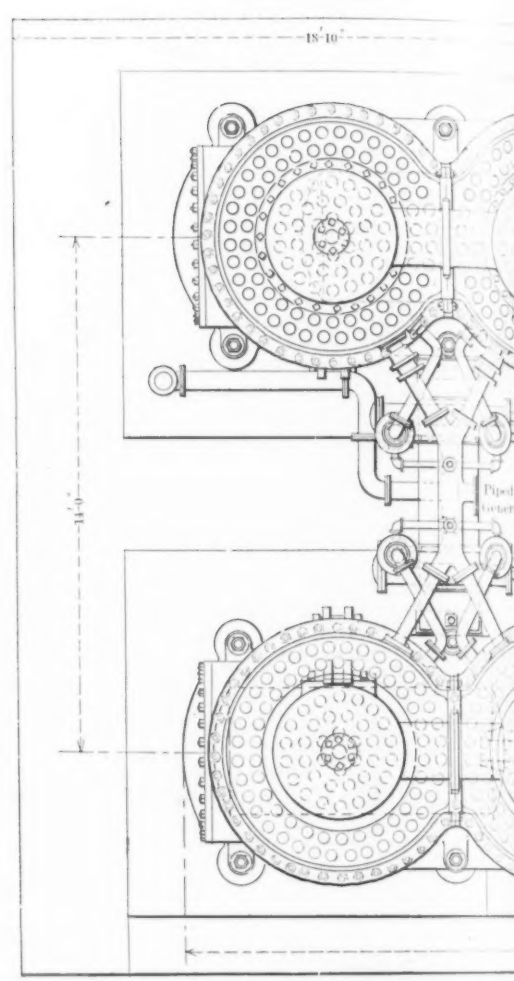
A large plate-glass deal was effected in Pittsburgh recently by the Pittsburgh Plate Glass Company, who are said to have paid \$1,500,000 for the Forest Plate Glass Works, thus securing control of the entire plate-glass business in that section, if not in the country. The company already owned two large factories, and this acquisition of the third gives them con-



Development of Rose.

trol of a combined production of 500,000 feet of plate-glass per month. The three factories are all in the Allegheny Valley, near Pittsburgh. Capt. J. B. Ford, who was the principal owner of the Forest City works, is also a heavy stockholder in the Pittsburgh company.

The present population of Chicago is 853,000. By incorporating in a single municipality the half-dozen villages in her environs, as contemplated by a bill pending in the State Legislature, she will have 1,221,000 inhabitants and rank second only to New York among American cities.

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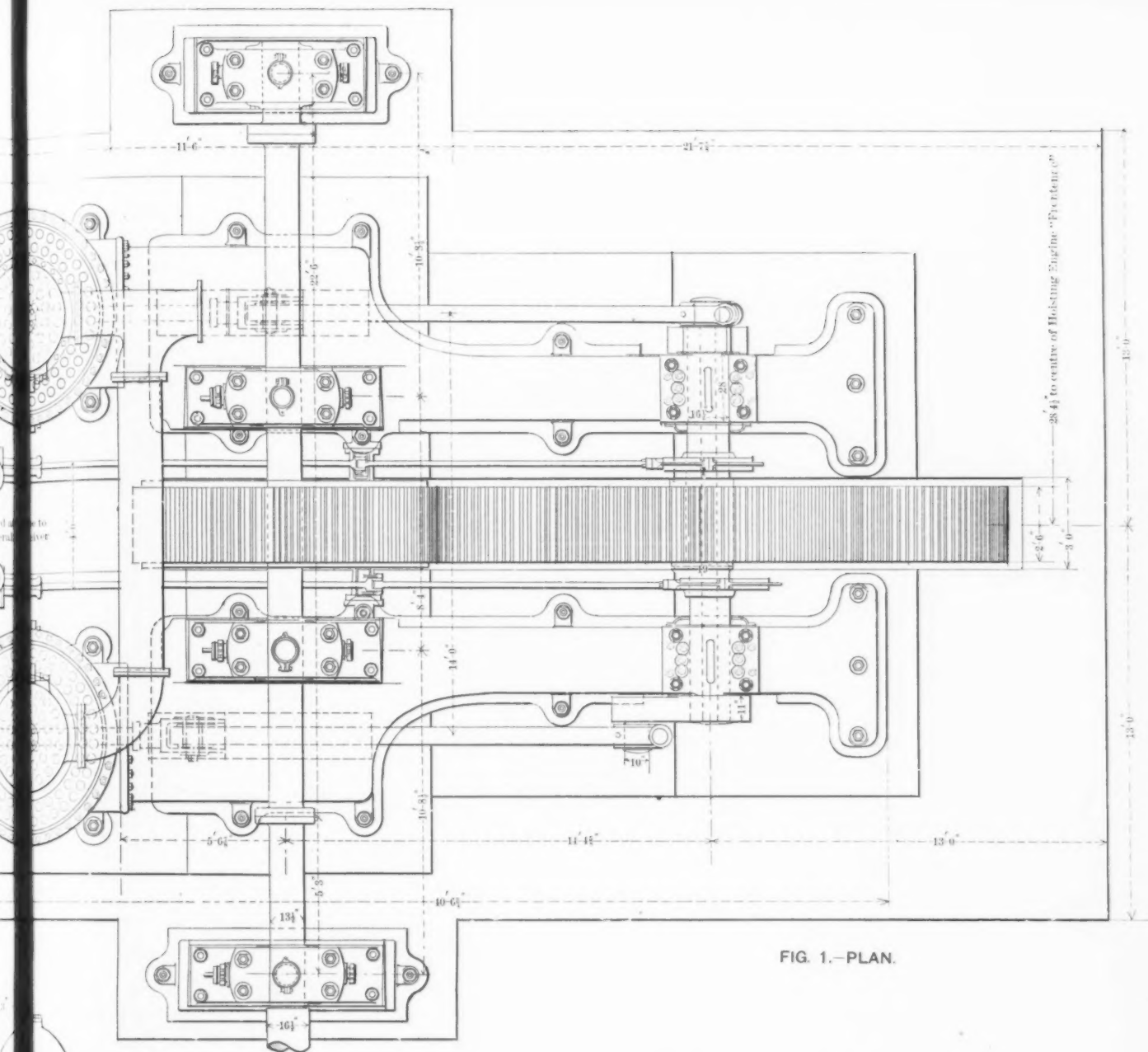


FIG. 1.—PLAN.

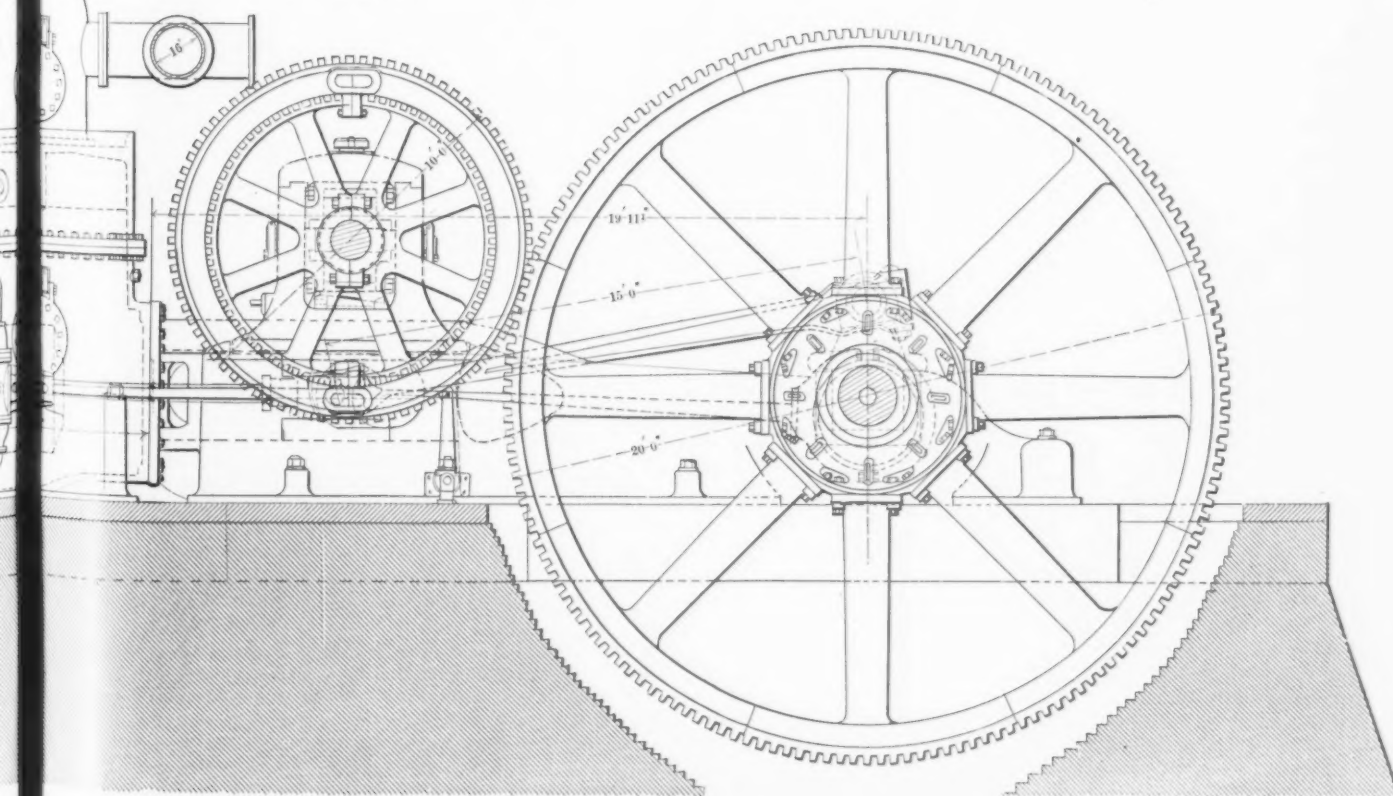
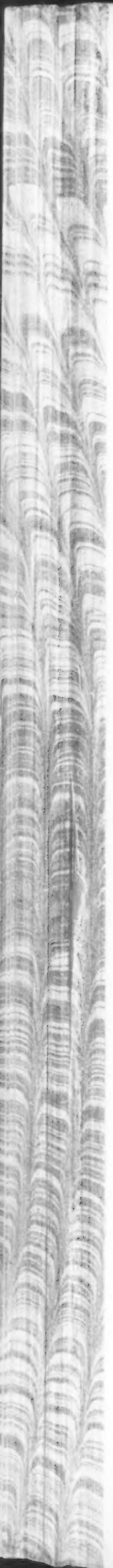


FIG. 2.—SIDE ELEVATION.



THE WEEK.

The North German Lloyds Steamship Company, one of the most successful in the Transatlantic trade, in their balance sheet for 1888 show an exceptionally strong position. The fleet comprises 140,000 tons, standing on the books at a valuation exceeding \$13,000,000. Besides they hold property worth at least \$2,000,000 and \$1,400,000 in cash and securities.

One of the Paris newspapers, whose founder is an American, urges the importance of sending out from the United States a strong representation of trained mechanics to the Paris Exposition. An idea that should be heeded.

C. P. Treat, the well-known railroad contractor, who has been with a company of engineers on the Nicaragua Canal for some time past, says an expedition will start from the United States May 10, and upon its arrival at Greytown active work will be begun. A hotel to accommodate 500 people will be shipped to Greytown by a New York company.

The Monongahela Furnace Company, who are connected with the National Tube Works Company, of McKeesport, have broken ground for the large blast furnaces which will be erected in that town. The building of the furnace will be commenced about May 1.

Charles Denby, United States Minister to China, speaking of taxation in that country, says: "The chief tax is on land; there is no tax on personalty. The land tax, the salt monopoly, lekin, foreign and native customs duties, and the proceeds of sales of honors and offices make up the revenue of the State. To the absence of taxation of the people," he says, "may well be ascribed the permanence of the Government and the tranquillity and contentment of the Chinese race."

Admiral Kimberly, in his official report of the disaster at Samoa, commends Captain Kane, of the English steamer Caliope, which successfully steamed out of the harbor, for turning over to the Americans his complete diving outfit, which would prove valuable in saving guns, &c.

Laredo, Tex., is a rising city on our Southern border, like Tacoma, Seattle and other points in the extreme Northwest, the outgrowth of railroad extension. The completion of the Mexican National Railway through to the City of Mexico from Laredo last November gave such an impetus to international traffic that in less than six months Laredo can boast all the modern conveniences characteristic of American cities—viz., two steel bridges of six spans each across the Rio Grande, one for railroad purposes and the other for general traffic; an electric light plant, lighting the twin cities Laredo, Tex., and New Laredo, Mexico; a Holly system of works with more than 11 miles of mains; an ore reduction works, an electric motor street railroad system, now in course of construction; the Mexican National Railway machine shops, to cost \$600,000, and the largest shops west of the Mississippi River. As a manufacturing center Laredo claims to possess advantages seldom found in growing cities; coal in large quantities at her door, water, light and power in abundance, and her citizens predict that she will become the largest and most important city on the line of traffic between South America, Mexico and the United States.

Lord Lonsdale, who started from the Hudson Bay Company's station a year ago on Arctic exploration, reports that near Peace River he discovered a remarkable formation of salt, and mica in blocks 8 to 12 feet square. In the region of Hay

River he found the Alexandria Falls, about 200 feet high and $1\frac{1}{2}$ miles wide at the top, which appeared much grander than Niagara.

In Boston, where both the conduit and overhead-wire systems of electric car propulsion have been tested by daily use during the past three months, the latter seems to be regarded as by far the more advantageous. In very wet weather there has been too great a leakage of power from the conduits, and in more than one instance the cars have had to depend on horses for propulsion. Malicious persons, by sticking a bit of iron into the conduit, can at any time make a "short circuit" and stop all cars beyond that point.

The chartering of an iron steamship to load 30,000 bags of sugar at Matanzas, and to tow the barge Atlas with a full cargo from the same destination to the Delaware Breakwater, marks an innovation in the shipping trade.

Colonel Auchmuty, the New York architect and builder, is doing an excellent work in his trade schools in training young Americans to a practical knowledge of such industries as bricklaying, plumbing, carpentering, stonemason work, and the like. It is said that \$750,000,000 pass yearly through the hands of the master builders of this country, and until Colonel Auchmuty started his trade schools, in the absence of the apprenticeship system of the Old World, most of the skilled artisans were foreigners. Two thousand young men have been already graduated from the institution, which he began as an individual enterprise, and are finding their way into good positions throughout the country. They have had every advantage that education can give them, and the final test of their mechanical skill and general efficiency has been reached through examinations, prizes and public exhibitions, which are powerful incentives to good work.

The Newfoundland seal fisheries are this season prolific beyond anything known heretofore. One vessel entered the harbor of St. Johns with 38,000 seals aboard; another took in 32,000, another 31,000, and several others almost as many. Judging from the cargoes already delivered it is estimated that the spring catch will number over 500,000—worth \$1,125,000. The seals are taken on the ice off the east and north coasts.

The Haytien admiral, Howard M. Patterson, ex-instructor of the New York School of Navigation, has come to New York to buy a steamer for the Legitime faction, whose triumph he predicts to be very near.

Claus Spreckels will start the \$3,000,000 sugar refinery in Philadelphia about June 1, and his confidence of success is not a whit abated. He is quite ready to fight the trust on their own ground. The factory for beet sugar erected by him at Watsonville, Cal., at a cost of \$500,000, has declared a dividend of 5 per cent. on the first year's operations. Mr. Spreckels says: "My own idea is that in a few years we will import no sugar. Not only does the beet grow to perfection in California, but it can as easily be grown here in the Central States, and in Kansas particularly. In California we get from it 13 per cent. of sugar to 9 per cent. that the European beet produces. A short time ago the few remaining shares of a \$5,000,000 stock company, of which I own a majority, were subscribed in San Francisco and a new company incorporated, which will be amply able to supply America with beet sugar. After this first year's trial we shall now go into the business on a large scale. Ten new factories at a cost of \$500,000 each will be built in different parts of California. They will turn out only the raw sugar, it having been found impracticable to at-

tempt to refine at the factory during the season. The product will be sold to refiners. The Philadelphia refinery will not handle this beet sugar. It will be wholly devoted to refining the raw imported article. With both of these companies in operation I think I can work against any trust."

The Roosevelt Hospital, in this city, receives by the will of William J. Syms \$350,000, the larger part of this amount to be expended for the construction of a "surgical operating theater."

Letters received from the contractors engaged in building the Chignecto Ship Railway, between the Bay of Fundy and the Gulf of St. Lawrence, report rapid progress, the winter having been very favorable for the work. The success of the project is considered assured, as it has been subsidized by the British Government to the extent of \$170,000 annually for 20 years. The railway is 17 miles in length, and the contractors agree to have it finished about August, 1890. It is being built on the same principle as the proposed Tehuantepec Ship Railway. The engineers and builders are Benjamin Baker and John Fowler, the latter known as having built the great bridge across the Firth of Forth, in Scotland, and ranking high among modern engineers.

Sea post-offices on the mail vessels plying between the United States and ports in Europe, after the manner adopted on our interior mail routes, is a suggestion worthy of consideration. Attention is directed to the fact that much delay is occasioned in the delivery of the mails owing to the fact that they have to be assorted and distributed after being landed at the port of destination of the steamer. The suggestion is made by the German post-office authorities in Berlin that Germany and America share equally the expense of employing clerks for the distribution of the mail while crossing the ocean, so that when the mail arrives at the port of destination it will have been assorted for all the large distributing offices, either in Germany or the United States.

Crop accounts carefully collected from all parts of California give assurance of an enormous harvest the coming season. The wheat fields are already heading out rapidly and promise the largest crop ever known. Fruit and vines look well.

The companies whose poles have been removed from the streets by Mayor Grant's orders are smarting severely at the penalty of delay. Many of the poles cost \$100 each, aside from the work of erecting them and stringing the wires.

The sunken steamer Atlas, in the North River, was moved several hundred feet, when unfortunately the swash from a passing steamer caused the chains to break from the pontoons and she again sunk.

The big Rockaway Hotel, which cost over \$500,000 to carry out the first building plans, and nearly double that sum before it was completed, was sold for \$27,000 to C. F. Southard & Co., dealers in building materials.

Yellow fever has already taken one victim in Florida this season, the disease having appeared at Sanford, about six miles from Enterprise. Surgeon-General Hamilton and the State Board of Health have been in conference to prevent the spread of contagious diseases. Those points are believed to be most exposed which escaped last year, as residents who have once been through the ordeal are supposed to be comparatively safe.

The new floating palace Puritan, of the Fall River Line, fully realizes expectations, the working of the engines being perfect.

Andrew Fletcher, of the W. & A. Fletcher Company, who built the engines, said after the first trip that the Puritan will easily travel 21 miles an hour. "The record of the run," said Mr. Fletcher, "shows that the boat made over 20 miles an hour, and that, too, under only 65 pounds pressure. Her regular pressure will be 110 pounds. The run from Watch Hill to Point Judith—a distance of 20 miles—was made in one hour, and the engineers declared that even then the steamer did not develop within 800 of her horse-power."

MANUFACTURING.

Iron and Steel.

A press dispatch from Youngstown, Ohio, under date of the 24th inst., says: "The findings of Theodore Hall, to whom was referred the application of Dan P. Ells and others for the dissolution of Brown, Bonnell & Co., were filed to-day. The referee was appointed in 1884, and the amount involved is \$2,000,000. Referee Hall finds that it would be beneficial to the stockholders if the corporation should be dissolved and its affairs closed up. The delay in the rendering of the decision was done with the hope that before this time the corporation would have been able to discharge its obligations fully."

The nail factory of the Kelly Nail and Iron Company, at Ironton, Ohio, is not in operation at present.

Gordon, Strobel & Laureau, Limited, of Philadelphia, have just closed a contract with the Belmont Nail Company, of Wheeling, W. Va., for a third Gordon, Whitwell-Cowper fire-brick stove.

Carnegie, Phipps & Co., Limited, of the Homestead Steel Works, at Homestead, Pa., have succeeded in turning out 24-inch beams. The new beams are for Cramp & Sons, shipbuilders, and are to be used in the construction of one of the Government's new cruisers.

The Emaus Pipe Works, at Reading, Pa., are at present filling an order for 400 tons of 3-inch cast-iron water-pipe for shipment to South America. The works are running to their full capacity. The owners had contemplated the enlargement of their plant this summer, but they have now decided not to make any changes until the present general business stagnation has changed very materially for the better.

The entire plant of the National Tube Works Company, at McKeesport, Pa., is in full operation and is turning out about 36 carloads of pipe every 24 hours.

On the 26 ult. the Swindell & Smythe Company, engineers and contractors, of Pittsburgh, received a contract for the erection of a fuel gas plant, consisting of a fuel gas generator and the converter furnaces, from the Montreal Rolling Mills Company, of Montreal, Canada. The first-named firm inform us that this is the first contract ever given by any concern not located in the United States for the erection of a fuel gas plant and the result of the experiment will be watched with considerable interest.

The nail factory of the Junction Iron Company, at Mingo Junction, Ohio, closed down on the night of the 20th ult. for an indefinite period.

The rolling mill of the Wheatland Iron Company, at Wheatland, Pa., which has recently been leased by some capitalists, is now ready for operations and is only waiting for orders, according to the superintendent, Thomas Woods. The large hydraulic machinery is said to be perfect

in every department. The puddling department will undergo several slight changes before being put into operation.

The nail factory of the Belmont Nail Company, at Wheeling, W. Va., closed down on the 24th ult. for an indefinite period.

The assignee of the Reading Iron Works has issued orders to start up the large pipe mill of the company on Monday, May 5, for the purpose of finishing a large quantity of pipe which was under process of manufacture at the time of the suspension of the company.

A consignment of 1750 tons of manganese ore from Turkey, for use at the Edgar Thomson Steel Works, at Braddock, Pa., was received at Baltimore last week.

The new plant of the Latrobe Steel Works, at Latrobe, Pa., is rapidly approaching completion, and will be ready for operations at an early date. The following are the officers of the new concern: Marriott C. Smyth, president; Walter H. Bryant, secretary and treasurer; Guiliam Aertsen, manager; and Julian Kennedy, chief engineer. Previous to going to Latrobe Mr. Kennedy was located at the Homestead Steel Works, of Carnegie, Phipps & Co., Limited, at Homestead, Pa.

No. 2 furnace of the Pennsylvania Steel Company, at Steelton, Pa., is idle at present undergoing extensive repairs. It will be ready for blast at an early date.

Work on the new plant of the Youngstown Bridge Company, recently organized at Youngstown, Ohio, will be pushed to completion as rapidly as possible. J. M. McDonald, formerly with the Morse Bridge Company, is supervising the erection of the works.

The foundations for the new rod mill now in course of erection by the New Castle Steel Company, of New Castle, Pa., are almost completed, and it is expected that the plant will be ready for operation early in August next. About 150 tons of wire rods will be turned out every 24 hours, about half of which will be used by the New Castle Wire Nail Company, of that place, the balance being sold in the open market. The works will give employment to about 100 men.

We are informed that the report that the nailers in the employment of the Bellaire Nail Works, at Bellaire, Ohio, had concluded to accept a reduction of 35 per cent. in their wages and resume work is without foundation. The nail factory of this firm has been idle for some months, and will not resume operations until there is a decided improvement in the nail trade.

The Sharon Steel Casting Company, of Sharon, Pa., are about to commence the erection of an open-hearth steel-melting furnace, which when completed will add considerably to the capacity of the plant. The firm report that they are enjoying an excellent trade.

The plant of the Stony Creek Iron Company, Limited, at Norristown, Pa., which, for the past few years, has been running spasmodically and has been idle since early last fall, resumed operations on Tuesday, the 23d ult., giving employment to about 200 men. This was brought about by a proposition advanced to the Stony Creek Iron Company by many of their old and most trusted employees, and accepted by the company. An agreement growing out of the proposition has been signed by the firm and most of the men. Under this agreement a scale of wages has been adopted, based on the selling price of iron. The men are to be informed as to

what the company receive for their product, and for every increase of \$2 per ton in the selling price the men are to receive a proportional increase in wages.

The strike at the plant of the Allegheny Bessemer Steel Company, at Duquesne, Pa., mention of which was made in these columns last week, still continues with but little prospect of an early settlement. Thus far there has been no outbreak, but trouble is liable to occur at any time. The officials of the company called on the Sheriff of Allegheny County for protection from the strikers and a detail of officers was sent to Duquesne from Pittsburgh, and are now guarding the works. It is said that several attempts have been made to start up a portion of the mill, with only partial success. At this writing every department of the works is idle. At a meeting of the stockholders of the company, held in their office in Pittsburgh last week, the old board and officers, consisting of E. L. Clark, president; H. P. Smith, secretary and treasurer; William G. Park, Robert B. Brown and D. E. Park, were re-elected.

The Cherokee Land and Iron Company, of New Birmingham, Tex., have been re-organized, a new company with an increased capital being formed under the name of the New Birmingham Iron and Land Company. The following officers and Board of Directors were elected: Mr. H. H. Wibirt, of New York, president and treasurer, and Mr. R. L. Coloman, first vice-president and general manager. The Board of Directors comprises H. H. Wibirt, of New York; R. L. Coleman, of New Birmingham; W. H. Hamman, of Calvert, Tex.; A. B. Blevins, of New Birmingham; Thomas G. Utley, of New York; John C. Hertle, of New York; O. H. LaGrange, of New York; Charles B. Wibirt, of New York, and Henry T. Kent, of St. Louis. The new blast furnace is to be pushed vigorously, and the drawings for a rolling mill are being prepared. A railroad is to be built from New Birmingham to the International and Great Northern Railroad.

Machinery.

Stewart, Corsey & Co.'s iron foundry, at Wichola, Kan., was burned on the 13th inst.; loss, \$50,000.

The valuable machinery of the Harlem Electric Light Company, in East 122d street, was destroyed by fire on Thursday night. The entire loss is about \$125,000.

We have received from the Chattanooga (Tenn.) Machinery Company a catalogue showing their special saw-mill and wood-working machinery, and also the steam pumps, engines and supplies made by them. The catalogue is illustrated by clear engravings, accompanied by brief descriptions of the construction and operation of the many machines shown. The price of each machine is given.

The Williams Engine Works are to have a Shaw electric traveling crane for their new shops at Beloit. It will have a span of 40 feet and be proportioned for a working load of 15 tons, but is to sustain a test load 50 per cent. in excess of this, or 22½ tons, without injury. It is being built by E. P. Allis & Co., of Milwaukee, who have had one of these cranes of 25 tons' capacity in operation in their foundry for several months.

Hardware.

Henry Disston & Sons, Philadelphia, Pa., are running full time with a force of over 2100 hands, and are turning out 400 dozen of handled saws daily, besides circulars, cross-cuts, &c.

The Gulf Wire Company have been organized in New Orleans for the manufacture of fence wire and wire goods. Of this

company Maximilian Herrmann is president; John M. Wiemann, vice-president, and Fred. Peters, treasurer. The works are located at the corner of St. Joseph and South Peters streets, and operations have been commenced.

The Putnam Nail Company, Boston, Mass., are making large additions to the works at Neponset, which will double their capacity. They recently shipped to San Francisco, Cal., four carloads, aggregating nearly 50 tons, of Putnam nails. This is probably the largest shipment of horse nails ever made, on *bona fide* orders. Mr. Ed. Brubaker, who is now on the Pacific Coast, was largely instrumental in bringing about this consignment.

The Water Elevator Purifier Company, of Cincinnati, report that their trade has increased over 100 per cent. during the year past; they are now about 1200 pumps behind their orders, while orders continue to come in. Many complimentary letters are being received daily from their agents testifying to the appreciation of the many new improvements recently added to the business.

A New Furnace Company.

The Monongahela Furnace Company has recently been organized at Pittsburgh during the present week. The stockholders of the new company are identified with the National Tube Works Company, of McKeesport, Pa., although in every respect the new concern is an independent corporation. The following is a partial list of those interested: David W. Hitchcock, Edmund W. Converse and William S. Eaton, of Boston; John H. Flagler, E. C. Converse, of New York; C. I. O'Connor, Horace Crosby and J. R. Jackson, of Pittsburgh. As soon as the charter has been granted, an organization meeting will be called, at which the necessary officers will be elected. At the present time nothing definite has been settled concerning the details of the organization. It is the purpose of the company to erect two blast furnaces on property recently purchased in McKeesport, in close proximity to the plant of the National Tube Works Company. They will be models of their kinds as to size, construction and equipment, and will be fitted up with all the latest improvements and will, no doubt, upon their completion, rank among the finest-equipped blast furnaces in the country. While the exact dimensions have not as yet been decided, it is expected each one will turn out about 175 tons per day each.

The greater part of this product will be consumed by the National Tube Works Company and other industrial establishments in McKeesport, while the balance will be sent to Pittsburgh and other points. The construction of the furnaces will be commenced in a short time, and they will, in all probability, be ready for operations at the close of the present year. As soon as the organization is completed, they will acquire possession of the Edith Furnace Company, of Allegheny City, Pa., who have been operated during the past three years by a corporation consisting of the following named gentlemen: John H. Flagler, E. C. Converse, J. R. Jackson, Horace Crosby and C. I. O'Connor. The Edith Furnace, under the management of the above named gentlemen, who are the owners and constitute the board of directors, has been a very successful plant, and these directors will occupy corresponding positions in the new enterprise, so that the Monongahela Furnace Company, while seemingly a new organization, nevertheless starts out under the guidance of directors thoroughly experienced in the business. We are advised that an arrangement has been made with

the different lines of railroads entering McKeesport, by which that place has been taken into what is known as the Pittsburgh district, and will secure the same rates on stock as are granted to all furnaces in the Pittsburgh district. This is an important concession and will allow the company to compete in the open market with Pittsburgh concerns.

Freight Matters.

The freight agents of the various railroads having connections with Pittsburgh have decided on the rail and lake rates from that city to the Northwest. To St. Paul, Minneapolis, Stillwater, &c., by way of Cleveland and Duluth, the rates are 81½, 72½, 52½, 35, 29 and 24. Articles of iron and steel manufacture in less than carloads take a rate of 29 cents; in carloads, 27 cents; railroad supplies in carloads, 21½. The new rates went into effect on Monday, the 29th ult.

The freight agents of the railroads having connection with Youngstown, Ohio, have reduced the pig-iron rates to and from Mahoning Valley points. The new pig-iron rates to Cleveland and Akron from these places are 60 cents for cinder and 65 cents for pig iron. The rate on cinder from the valley points to Pittsburgh has been reduced from 65 cents to 60 cents, and pig-iron from 80 cents to 65 cents. The rates to Uniontown and Scottsdale will be \$1.30 for scrap iron, blooms, &c., and \$1.15 for pig-iron and muck iron. These rates went into effect May 1.

The Union Pacific Railroad Company have made arrangements to receive Pittsburgh freight for Tacoma, Seattle, Port Townsend and Victoria, B. C., direct. They wish shippers to route shipments via Union Pacific Railroad, Oregon Railway and Navigation Company and steamer from Portland. This gives new competition with the Northern and Canadian Pacific Railroads.

Ancient Monopolies.

The Canadian *Law Times* prints an edict issued in 473 A. D. by the Emperor Zeno to the prætorian prefect of Constantinople (Code iv, 59):

We command that no one may presume to exercise a monopoly of any kind of clothing, or of fish, or of any other thing serving for food, or for any other use, whatever its nature may be, either of his own authority, or under a rescript of an emperor already procured or that may hereafter be procured, or under an imperial decree or under a rescript signed by our majesty; nor may any persons combine or agree in unlawful meetings that different kinds of merchandise may not be sold at a less price than they may have agreed upon among themselves. Workmen and contractors for buildings and all who practice other professions, and contractors for baths, are entirely prohibited from agreeing together that no one may complete a work contracted for by another, or that a person may prevent one who has contracted for a work from finishing it; full liberty is given to any one to finish a work begun and abandoned by another without apprehension of loss, and to denounce all acts of this kind without cost. And if any one shall presume to practice a monopoly, let his property be forfeited and himself condemned to perpetual exile. And in regard to the principals of other professions, if they shall venture in the future to fix a price upon their merchandise, and to bind themselves by agreements not to sell at a lower price, let them be condemned to pay 40 pounds of gold. Your court shall be condemned to pay 50 pounds of gold if it shall happen through avarice, negligence or any other miscon-

duct that the provisions of this salutary constitution for the prohibition of monopolies and agreements among the different bodies of merchants shall not be carried into effect.

H. C. Frick, chairman of the H. C. Frick Coke Company and Carnegie, Phipps & Co., Limited, of Pittsburgh, has transferred to the H. C. Frick Coke Company his individual interest in a tract of coal land, south of Uniontown, in Fayette County. The property consisted of one-eighth interest in 1690 acres and his one-twelfth of 1020 acres of coal, for which the price paid was \$70,370.15.

John D. Wick, formerly of Wick, Arms & Co., Youngstown, Ohio, has connected himself with the sales department of the Calumet Iron and Steel Company of Chicago.

Lieut. Jacob J. Hunker, U. S. A., Supervisor of the Harbor, has moved into his new office in the Army Building, in Whitehall street.

Minister Palmer, who is about to sail for Spain, was honored by a banquet in Detroit Tuesday night.

Judge Yates acted an honorable part in voting for the Fassett Prison bill and expressing his commendation in words.

The formal opening of the Engineers' Club took place on Saturday, April 27, at the club house, 10 West Twenty-ninth street, New York. The building is one of the old-fashioned large dwellings and is admirably adapted to club purposes. The new club has simple but elegant appointments and promises to become very prosperous. The membership now exceeds 350, of whom about one-half are residents of New York and its suburbs, while the non-resident members include engineers from all parts of this country, Canada, Mexico and South America. The following officers were elected: James A. Burden, president; W. R. Towne, of Stamford, and James C. Bayles, vice-presidents; A. C. Rand, treasurer, David Williams, secretary, in whose absence C. Kirchoff, Jr., acts as secretary *pro tempore*, and the following managers: F. S. Witherbee, of Port Henry, N. Y.; J. F. Holloway, W. A. Perry, Prof. T. Egleston, J. C. Platt, Jr., Waterford, N. Y.; William Metcalf, of Pittsburgh, Pa.; Andrew Carnegie, C. E. Emery, Dr. R. W. Raymond, Edward Cooper, F. R. Hutton, B. S. Church and Charles Macdonald.

Ex-Governor Pillsbury, of Minnesota, has given \$150,000 to the State University to establish a Hall of Science.

John C. New, Consul-General to London, has taken his departure.

Robert P. Porter, Commissioner of the Census, has entered upon his duties.

The Canadian Premier, Sir John Macdonald, replies to a deputation applying for railway subsidies, that the state of the public finances demands caution, and he intimates that the day for generous subscriptions has ended.

The Solid Ingot Company, of Newark, N. J., have sent out photographs showing admirably the fracture of steel ingots cast by their method, and contrasting them with ingots cast in the old style.

The Iron Age

New York, Thursday, May 2, 1889.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, JR., - EDITOR.
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - - - HARDWARE EDITOR.
JOHN S. KING, - - - BUSINESS MANAGER.

The Western Iron Trade.

For several years the month of April has not been characterized by an active condition of business in the West. But each year there were peculiar circumstances affecting the consuming interests and interfering with trade prospects which were thought exceptional in their nature. For instance, in 1886 the eight-hour agitation was a very prominent factor in unsettling business enterprises, in 1887 the railroads precipitated a condition of chaos by their rearrangement of freight rates in order to comply with the provisions of the Interstate Commerce act, and in 1888 the railroads were again charged with causing an unsatisfactory state of trade by their controversies with their employees. In each case the opinion was generally entertained that if the special disturbance had not occurred there would have been a fair volume of business and prices would not have dropped. This year, however, the exceeding quietness of trade cannot be ascribed to any such specified cause, yet the dullness is much more profound and far-reaching than during the periods previously cited. There are no strikes in progress which affect any considerable number of workmen, and even the threatened strike of Chicago carpenters for a uniform working day is having no effect on the local trade of that city. Of course the dullness must be accounted for in some way, and the railroads afford a convenient scapegoat. They are purchasing very sparingly, and as long as they are so economical business must perforce be dull.

Assuming that this view of the case is thoroughly sound, especially as it is so well fortified by corroboratory circumstances, it simply puts April of this year in line with April of last year and of the year before, and so on. No matter what the cause may be, April seems predestined to be a dull month, whether one thing or another must happen to make it such. We ignore the fact that February and March were months of reasonable activity in iron circles, even though the railroads were buying as sparingly then as in April. With the quietness of previous corresponding periods intensified this year, the month of April has seen lower prices for most iron and steel products than were ever before known in the West. Competition between sellers has been very bitter, notwithstanding the comparative insignificance of the prizes contended for in the shape of small orders. At present writing there is less business transacting in heavy material than at any time of the year for several years, and prospects are not bright for a speedy improvement.

But what of the future? It is on just such a condition of affairs as now obtains that the foundations for a rapid appreciation of values are laid. Manufacturers get discouraged and withdraw from a business

in which they are merely wasting their substance instead of increasing their accumulations. A movement of this kind has already begun, and the voluntary withdrawals are accompanied by others whose retirement has been hastened by legal process. A continuance of this depression throughout May and June would result in such a decided restriction of production that the supply would be found unequal to the demand, and the usual after-harvest activity in all branches of business would send prices upward with a bound.

Considering the excellent financial condition of the country, the abundance of unemployed capital, the absence of disturbing influences generally, and the progressive nature of our people, it is impossible that trade should continue to go from bad to worse until we reach a finality of universal ruin. The downward course will be checked, and will probably be checked very suddenly, as is the case with all reactions. Then there would be danger of a "boom," which is to be feared and if possible avoided. The boom of '79-'80, with its wild excesses and extravagant transactions, was a serious blow to legitimate business whose effects were felt for years. We desire and need prosperity, but not of such a violent character. Yet with all the dullness existing at present, this prospect looms up in the future. If the railroads are really as bare of necessary supplies as they are represented to be, and are in as great need of track materials and rolling stock as is reported, they will all be in the market about the same time and their purchases will enormously stimulate trade. It is a time for caution and conservatism by manufacturers, particularly in making contracts for long-time deliveries. Materials of all kinds are low, wages in Western mills are not likely to undergo any change of consequence, and it appears altogether incredible that six months from to-day the prices now prevailing will seem high.

Uniform Freight Classification.

There is one subject of importance to all business interests which has not yet received much public discussion. We allude to compulsory uniformity in the classification of freight by our transportation companies. It will be remembered that Congress came very near passing a bill compelling the railroads to unite upon a classification at a date now passed. Acting upon this hint the Interstate Commission asked the various State commissioners, at their convention in Washington last March, for their opinion. The result was a resolution that "still further advance toward uniform classification of freight will promote the welfare and convenience of shippers." Thus the mercantile community seem committed to the movement through the action of those supposed to represent their interests. It is very questionable whether these gentlemen have fully considered this matter. Several members said that they were not prepared to state their opinion, and in the debate it was apparent that all the consequences had escaped attention. Nowhere is the meaning of the term "uniform" defined. This should have been done long ago.

There are four important classifications

now in use—the Official, between the Mississippi and the seaboard, north of the Ohio; the Western, west of the Mississippi; the Southern, south of the Ohio, and the Transcontinental, for Pacific Coast traffic. Other State or local classifications are also in use within limited areas. These classifications, while having many points of resemblance, differ radically in very important respects, and it is precisely these differences which are aimed at because they affect great staples. These classifications have in process of time come to cover sections of the country which have uniform business methods with similar manufacturing or agricultural products. Hence, as we would expect, we find these articles of traffic, which are native to the territory, given special consideration in each of these classifications, such special rates not being granted in any of the others. This is natural and proper. Cotton, for example, that great Southern staple, receives a special rate south of the Ohio, a favor not found in the Official classification except in competition with Southern routes. California raisins are brought to New York at rates which the railroads are not willing to accept on their general shipments of that article. If "uniform classification" means that the classes or rates ruling in one section must be made the basis of rates everywhere in the United States, then every merchant whose business depends directly or indirectly upon the prosperity of his State and upon obtaining the best prices for its special product must be prepared for misfortune.

There is another point. Under the present system any industry temporarily depressed may find help from the carriers who are most dependent upon its prosperity, a help which must be denied if the reduction were to affect every local road hundreds of miles away. We have had something to say of late upon the necessity of a reduction of freight rates upon iron in the States east of Chicago. But it does not follow that such reduction when made should be accompanied by a similar reduction west of that city. The competition of Pittsburgh and Birmingham with Chicago furnaces is reason enough for a lowering of rates to that city. But west of Chicago no such competition exists, and there is no necessity as yet for any changes. But if the principle of "uniformity" is to be rigidly enforced and reductions east are to be followed by reductions west, it is easy to see that the difficulty of securing any changes, however just, is immensely increased. Must the shipments from any large center like Pittsburgh be governed as to rates by the needs of a little local road for exceptionally high classification or tariffs? And if uniform classification does not mean this, what does it mean? Any single exception allowed would destroy the uniformity and bring on confusion even greater than now.

The whole supposed need for uniformity is founded on a misconception—that differences are of themselves to be condemned. On the contrary, discrimination between persons and things lies at the bottom of all trade. In business these discriminations adjust themselves, but in transportation we must adjust them on a theoretical basis, but they are not of themselves wrong or unjust on that account. Discrimination in classification or in freights between dry goods and pig-iron is ap-

proved by every one. Upon the same ground the Southern classification is right in favoring cotton and the Pacific upon raisins. In like manner low rates on iron in Pennsylvania are more necessary than in Montana. The one is a section where small profits are the rule, in the latter large profits are common, and the same condition is naturally reflected in the tariffs and classifications. It would do violence to business principles to have our railroads compelled to go out of touch with the industries they serve and thus to classify lower in Montana and higher in Pennsylvania.

Under these conditions a committee is now at work trying to unite all differing classifications into one. They find it very difficult, but are still at work. It is high time that the business community took an interest in the question. A definition of terms should be asked of the Interstate Commerce Commission, and with this before them, our merchants should carefully consider whether the commerce of the country would be helped or injured by an enforced uniformity of classification and of freight rates based upon it.

The Cost of Copper-Mining.

While everybody connected with the copper interest, either as producer, dealer or manufacturer, is forced to wait patiently for developments, the study of some of the questions affecting the future of the metal is timely. Whether or not the magnates among the mining companies, who, we are told, have at last learned to know and respect one another, will succeed in reaching some basis with the financiers who were caught, is a matter concerning which no forecast is possible. The greed of one or the pride of another may upset the fondest hopes of those who believe that an adjustment is possible. The difficulties are so great, complicated as they are by personal motives and interests, that very many well-informed men scout the idea that a *modus vivendi* will be found. Even if something is finally patched up, it must be very radical indeed if it is to inspire confidence. The history of the past year has pretty thoroughly proved that it is a very costly matter to hold the market above its natural level. It is clear that it would be folly even for a Rothschild to keep prices at a point that would encourage a liberal supply and at the same time hamper consumption even slightly. Throughout the trade little sympathy will be wasted either on the mining companies or on the bankers whose eagerness for commissions put them into the uncomfortable position of being holders of copper. Both have reaped what they have helped to sow, and while the companies may contemplate last year's balance sheets with satisfaction, the net returns for the next two or three years may finally raise some doubts as to the wisdom of having allowed themselves to be inveigled into a false move by reckless speculators.

In all the discussion which is now going on one fundamental error seems to have a strong hold on producers and bankers, and that is that within certain limits they possess the power to establish a price. They all concede that M. Sécretan made a fearful blunder, but the conviction seems to be that his cornering operation failed, not because it is impossible to control the market, but because he was altogether too liberal to the mining companies and at-

tempted to extort too high a price. They say, practically, that the thing cannot be done at 16½ cents a pound with unlimited production, but it can be done at 12 cents with a limited output. They assume that the attitude of the seller settles the matter, and seem utterly indifferent to possible effects produced by hostility on the part of the buyers and the trade. The latter, too, may have formed their convictions, and though their voice is not heard in the councils of the magnates, their influence will quickly be apparent in the course of the market.

A point which producers often raise when discussing the question of prices is that the average for a series of years should be accepted as representing the normal value. We believe that view to be erroneous, especially so far as this country is concerned. Ten years ago a few Lake mines controlled the market, and sustained it by exporting a small surplus at a sacrifice. Since then our production cannot be managed by any such methods. Since then costs have been reduced by improved mining methods, by the introduction of more efficient crushing, dressing and smelting appliances, by the lowering of the cost of fuel and supplies, and by cheapening of transportation.

Let it be conceded that to some extent the greater depth of the mines offset this lowering of cost; still a balance remains. We contend that the cost of production to-day, plus a fair profit, an allowance for repairs to machinery and new construction, and a sinking fund to cover exhaustion of deposit, represents the normal price. Under present circumstances that price must be the maximum, because in some way a part of the accumulated stock must be marketed. So far as the Lake mines are concerned the bare cost of production is easily arrived at. The annual reports of a number of companies allow us to figure it out quite closely. The Tamarack, the young neighbor and rival of the Calumet and Hecla, reported on June 30, 1888, that the cost of its copper laid down in New York, all expenses paid, was 5.75 cents. Including all expenses for construction and for development work the cost was 7.20 cents a pound, based on a yield of 3.6 per cent. of ingot. The figures for the Calumet and Hecla are not known, but its rock is nearly 1 per cent. richer and its operations are on a much grander scale, so that its cost should certainly not be so high, in spite of heavy outlays for new construction and development. For the other leading mines we have the figures for 1888 as follows:

	Product.	Gross expenditure.	Cost per pound.
Franklin.....	3,655,751	\$406,583.02	11.12
Osceola.....	4,134,320	479,573.42	11.61
Quincy.....	6,367,809	500,880.24	7.86
Atlantic.....	3,974,972	435,683.93	10.96
Central.....	1,817,023	196,605.55	10.76

Of course during 1888 the majority of the mines went into exceptional expenditures for new machinery and development. All of them pushed their output vigorously, and a tendency was observed to handle lower grade rock, since it yielded a profit at high prices. On the basis of the figures given, a good profit could be realized by the Calumet and Hecla with an output of about 50,000,000 pounds, the Tamarack, which is producing at the rate of 15,000,000 pounds, and the Quincy, which may be placed at 6,000,000 pounds, a total of 71,000,000 pounds of ingot.

We possess little public information concerning the capacity of the Montana mines to meet low prices. The annual report of the Boston and Montana Company, at Butte, showed that the running expenses were \$740,714.32 on a product of 8,815,987 pounds fine, an average of 8.41 cents. Including construction and a payment for mining and smelting property purchased, the outlay was \$931,667.48, or 10.59 cents per pound. But the mine is now producing at the rate of 2,000,000 pounds a month, so that 9½ cents for casting brands is not likely to close it down. The Anaconda, with a product of 60,000,000 pounds, has leaner ores, but this may be compensated for by working on a very much greater scale. These two must depend upon the limited capacity of domestic refineries to convert their matte into merchant copper. A considerable part of the matte must be exported, and therefore will depend upon the English market. The Parrott, with a product of about 10,000,000 pounds, has its own refinery at Bridgeport and has close relations and a good trade in the Naugatuck Valley. Its capacity to meet low prices is not doubted in the trade.

In Arizona, companies representing an output of about 15,000,000 pounds would certainly continue at 9½ cents, and with their well-known reputation for quality would receive the preference over other brands. Assuming that the Lake, Arizona and Parrott copper remained at home and that one-half of the Anaconda and Boston and Montana were refined for the market, the supply to it would be 138,000,000 pounds of new copper, certainly enough to cover all our home requirements, and leave 42,000,000 pounds for export. In other words, three mines each in the Lake, Montana and Arizona districts could sell at 9½ and 10 cents respectively, running at a moderate rate, and leave a profit to their owners. To these concerns a 12-cent market would yield very handsome profits, while it would give life to a number of second-rate producers.

Iron Railroad Ties in Germany.

The efforts being made in this country, feeble as they are, to introduce iron as a substitute for wood for railroad ties may be prejudiced by the developments in Germany during the past few years. That country was the first to introduce the use of steel sleepers on a large scale, and was followed later by the railroads in other Continental countries, in Great Britain and in India. For some time past, however, the authorities—the greater part of the German railroads being operated by the State—have turned back to wood as a material. This movement has been viewed with much alarm by German ironmasters, and has resulted in a vigorous agitation on their part. At the last meeting of the Association of German Ironmasters H. Brauns, the general manager of one of the leading steel works of the country, presented a paper containing many interesting data. Its general tone and the arguments advanced are characteristic of appeals made to a paternal government. He seeks to establish the justice of his cause by pointing out that German interests are injured by substituting for steel ties, on which the State railroads secure income by hauling raw materials, wooden ties, a large proportion of which must be imported, because the forests of Germany cannot cover the whole demand. He estimates that 1,800,000 wooden ties are im-

ported. Taking about 110 pounds as the weight of a steel sleeper, they displace a possible consumption of 90,000 tons of iron. The freights on ore, coal, limestone, &c., to produce this quantity in the Rhenish provinces and Westphalia will average 15 marks, equal to a loss of gross earnings to the railroads of 1,485,000 marks. The wages, which will average 37.50 marks per ton of product, add 5,568,750 marks more of which national industry is robbed. All this money, Herr Brauns urges, should be kept in the country.

The statistics showing the quantities of wooden and iron ties put into the track of the Prussian State railroads and of all the German roads are well calculated to create uneasiness, the figures for a few years being:

Year.	Wood. Number.	Iron. Number.	Per cent.	Per cent.
1885-86	1,507,363	672,086	69.16	30.84
1886-87	1,582,877	522,470	75.18	24.82
1887-88	1,654,304	493,623	77.02	22.98

Year.	Wood. Number.	Iron. Number.	Per cent.	Per cent.
1885-86	2,462,004	1,007,152	70.97	29.03
1886-87	2,544,962	898,262	74.56	25.44
1887-88	2,677,424	750,670	78.10	21.90

The figures clearly show that steel ties are losing ground absolutely and relatively, and that the Prussian State railroads are taking the lead in what the ironmasters call the retrograde movement, since their proportion of the whole, which was 66.7 per cent. in 1885-86, fell to 65.7 per cent. in 1887-88. The estimates of the administration of the Prussian railroads indicate that they propose to persist in the same direction, since the budget calls for an expenditure of 9,310,220 marks for wooden ties, against only 4,168,886 marks for iron sleepers. The estimate for 1889-90 includes 33,514 tons of sleepers, while it calls for 78,770 tons of rails and 24,247 tons of fastenings, figures which show how important this matter is to the iron works.

During the discussion which followed Herr Brauns' paper no points were touched which might throw light upon the reasons for the change of policy on the part of the railroads. It is somewhat difficult to understand how a revulsion of sentiment among German railroad engineers can have taken place without good and sufficient reasons, from their standpoint. One fact, however, was brought out, which is certainly surprising. It appears that the administration of the Prussian State roads estimate the life of steel sleepers and ties at 15 years, or the same as that of oaken ties. Exact data are, of course, wanting, because a sufficiently long period has not elapsed to furnish figures upon which the life of steel ties can be even approximately estimated. Still, it appears utterly contrary to all experience to assume that a steel tie, subject to no wear, should not long outlast a rail, the life of which under ordinary conditions often far exceeds 15 years.

One of the speakers submitted data relating to the cost of steel ties as compared with oak, which we tabulate as follows:

	Steel.					Oak.
	1.	2.	3.	4.	5.	6.
Tie-weight, kg.	54.2	53.0	57.0	53.0	57.0	57.0
Tie	6.39	6.25	6.72	6.25	6.72	4.23
Hook plates	1.19	1.19				
Fastenings	0.41	0.40	0.40	0.74	0.74	0.96
Totals	7.10	7.84	8.31	6.99	7.46	5.19
Value as old material	2.77	2.92	3.12	2.78	2.98	0.50
Net	4.33	4.92	5.19	4.21	4.48	4.69

All the ties are placed at a cost of 118 marks a ton, equal to, roughly, \$28 a gross ton, while the oak ties cost about \$1 apiece. In this country steel ties can be contracted for on a large scale at the rate of about 2 cents per pound, one of the leading concerns in Pittsburgh having agreed to deliver the finished tie at that rate. Still, the prospect of their introduction on a large scale in this country is not very promising as yet. Very few of our railroads are in a position to carry along as an asset any heavy quantity of steel for its possible value as old material in decades to come.

Our Trade with American Nations.

The Bureau of Statistics at Washington has just published details of the trade of the United States in 1888 with other American countries as compared with the previous calendar year. We have used those particulars for extracting therefrom a table showing—reduced to thousands of dollars—the trade, in merchandise only, done with countries situated south of us, and another grouping together the Northern countries. The percentage of gain in our domestic export southward is highly gratifying, inasmuch as it has amounted to 8 per cent., the increase of import being 4 per cent. On the other hand, the export to Northern countries hardly shows any gain at all, the import thence increasing 9 per cent.

Trade of the United States with the rest of America.

In thousands of dollars.	Domestic export.		Import.	
	1888.	1887.	1888.	1887.
Argentina Republic	6,146	5,911	5,406	4,977
Bolivia	11	17	2	2
Brazil	8,161	7,104	55,259	56,378
Costa Rica	934	1,045	1,412	2,035
Guatemala	968	670	1,877	2,729
Honduras	657	575	1,258	994
Nicaragua	833	799	1,733	1,536
Salvador	693	574	1,670	1,132
Chili	2,188	2,377	2,437	2,631
Danish West Indies	601	632	471	430
Ecuador	893	808	812	1,195
French West Indies	1,761	1,459	43	358
French Guiana	152	146	19	7
British West Indies	7,787	7,007	14,304	12,221
British Guiana	1,626	1,551	3,825	3,165
British Honduras	358	334	219	198
Hayti	3,954	3,763	3,178	1,885
Mexico	9,607	8,370	17,629	16,294
Dutch West Indies	551	553	366	258
Dutch Guiana	277	241	462	457
Peru	752	829	318	419
Santo Domingo	910	957	1,401	1,324
Cuba	10,990	9,145	50,208	45,363
Porto Rico	2,054	1,863	3,728	4,516
Colombia	4,807	5,557	4,612	3,786
Uruguay	1,389	1,382	2,734	2,386
Venezuela	3,063	3,049	9,016	9,821
Totals	72,063	66,725	184,462	176,634
Miquelon	372	329	30	42
Nova Scotia, New Brunswick and Prince Edward Island	3,148	2,582	6,016	5,760
Quebec, Ontario, Manitoba and Northwest Territory	29,351	30,223	33,766	33,709
British Columbia	1,697	1,450	4,123	1,825
Newfoundland and Labrador	1,411	1,265	1,650	184
Greenland and Iceland			90	138
Totals	35,979	35,849	45,084	41,658

Countries south	72,063	66,725	184,462	176,634
Countries north	35,979	35,849	45,084	41,658
Totals	108,072	102,573	230,146	218,292

	Total trade.	
	1888.	1887.
Argentina Republic	11,612	10,888
Bolivia	13	17
Brazil	63,420	63,482
Costa Rica	2,346	3,080
Guatemala	2,845	3,405
Honduras	1,915	1,569
Nicaragua	2,566	2,335
Salvador	2,363	1,706
Chili	4,625	5,008
Danish West Indies	1,672	1,662
Ecuador	1,675	2,003
French West Indies	1,804	1,817
French Guiana	171	153
British West Indies	22,091	19,228
British Guiana	5,454	4,716
British Honduras	577	582
Hayti	7,132	5,648
Mexico	27,236	24,664
Dutch West Indies	719	811
Dutch Guiana	937	698
Peru	1,070	1,248
Santo Domingo	2,311	2,281
Cuba	61,198	54,539
Porto Rico	5,782	6,379
Colombia	9,419	9,352
Uruguay	4,123	3,768
Venezuela	12,079	12,970
Totals	256,555	243,359

Miquelon	492	371
Nova Scotia, New Brunswick and Prince Edward Island	9,164	8,342
Quebec, Ontario, Manitoba and Northwest Territory	63,117	63,932
British Columbia	5,820	3,275
Newfoundland and Labrador	3,061	1,449
Greenland and Iceland	90	130
Totals	81,663	77,507

RECAPITULATION.			
Countries south	256,555	243,359	
Countries north	81,663	77,507	
Totals	338,218	320,866	

The conclusion arrived at from the results disclosed by these comparisons is that the rise in coffee and sugar, as well as temporarily in hides, has increased the purchasing capacity of countries south of us so much last year that they have absorbed American products more freely. A gain of 8 per cent. in a single year is not a small matter, and encourages the very best expectations for the current year, in which sugar has so far advanced in a manner almost unprecedented. This advance will encourage the planters to extend their estates and enlarge their capacity of production by ordering more American machinery, &c. Should, on the other hand, our own crops be as abundant as they promise at this early stage, it will cheapen our flour, provisions and canned goods, and the bulk of what we shall ship southward during the latter half of 1889 will be all the greater. Since our export to Spanish America and Brazil is to be pushed this year with renewed vigor, everything will co-operate, we trust, to give as favorable results as those exhibited, perhaps even more brilliant ones, although another similar percentage of increase would no doubt fully satisfy our exporters and manufacturers.

Mr. Charles R. Stowell, bridge engineer of the New York Railroad Commission, has prepared a complete list of the railway bridge failures of last year, so far as reported, with the name of the road and circumstances attending each. The number of such failures in 1888 was 32, of which 1 was by fire, 10 by freshets, 3 while undergoing repairs, 6 were knocked down by trains, 5 were square falls, and 7 failed from unknown causes. Mr. Stowell also has statistics covering failures for ten years past, omitting the first two years, for which the record is presumably imperfect, 239 bridges having fallen in eight years, or within a fraction of 30 per year. In the meantime, however, the railway mileage has enormously increased—from 93,349 at the beginning of 1880 to 149,913 at the beginning of 1888, an increase of 60½ per cent. When this is considered the record of failures shows a gratifying decrease.

Freights in the Lehigh Valley.

Alleged discrimination in freight rates in the Lehigh Valley is the subject of grievous complaint. A prominent iron manufacturer in an interview said that Reading and the entire Schuylkill Valley is being discriminated against by the railroad companies; that this discrimination extended to all the inland cities and manufacturing towns, with the result of driving trade to the seaboard. He characterized it as a short-sighted policy which, if continued, would kill trade in and about Reading altogether. The excessive freight rates, he thought, had as much as anything to do with the failure of the Reading Iron Works. He said: "All the rates of the railroad companies are now being made in favor of the long haul. When we complain of this they answer us that they cannot lower local rates one particle without losing money, for the reason that every ton carried on a long haul entails an actual loss. Such action does not display any ability, for it simply crushes out local trade, reducing their business on short hauls. It is killing the goose that lays the golden egg. Our rates in this city and this valley are so high that it is impossible to manufacture at a profit. The freight on coal and iron on short hauls is 2 and 3 cents per ton per mile, while on long hauls it is from $\frac{1}{2}$ to 1 cent. For Southern iron the rate is $\frac{1}{2}$ cent per ton per mile, and I know one furnaceman in the South who has a contract for ten years at $\frac{1}{2}$ cent per ton for both long and short hauls. At our rates it is impossible to compete with these people. Two weeks ago the Lehigh Valley and Philadelphia and Reading railroad companies lowered their rates to Philadelphia, New York, Buffalo and other large markets, but our local rates have not been touched. From the Schuylkill coal fields to this city the tolls on coal are 80 cents to furnacemen and \$1.40 for domestic consumption. All manufacturers, except furnacemen, must pay the domestic rate. The haul from the Lehigh coal fields to Bethlehem, Allentown and Catasauqua is no longer than from the Schuylkill region to this city and yet the rates are 20 per cent. lower. The furnace rates to these places are 65, and the domestic rates \$1.10 and \$1.15. The toll on a ton of coal to Philadelphia is but 40 cents a ton more than to this city. This discrimination against Reading is slowly but surely closing our factories, and if it continues will deal a death blow to all our industries." This is a fair reflection of the sentiment of all the manufacturers of the Schuylkill Valley on this subject. These complaints extend not only to the local rates on coal ores and iron, but to the policy which leads to the carrying of manufactured goods to New York, Philadelphia and other markets from points of production much further away at rates either absolutely less in amount or much less in proportion to the distance.

Sunday freight trains are being discontinued so far as practicable on the Vanderbilt lines as well as on the Pennsylvania road. The new arrangement will take effect May 1, comprising all the Vanderbilt lines east of Chicago. Live stock and perishable freight will be forwarded as usual to its destination. The company expect that when merchants learn that imperishable goods are not moved on Sunday they will calculate accordingly and ship their goods at such time as will prevent loss to either party. In like manner General Manager Hickson, of the Grand Trunk Railway, has ordered that no freight trains be run on Sunday, except those carrying live stock and perishable goods. The Delaware, Lackawanna and Western, also the Delaware and Hud-

son Canal Company are in hearty sympathy with the movement. The New York, New Haven and Hartford road and the New England road have been running, practically, no Sunday freight or excursion trains for two years.

Wrought-Iron and Steel Eye-Bars.

Carl Gayler, discussing the relative merits of wrought-iron and steel eye-bars before the St. Louis Engineers' Club, reached the following conclusions:

The wrought-iron eye-bar has had its time; steel is rapidly taking the place of iron, and it will not be long before it has superseded iron for pins and eye-bars as completely as the steel rail has taken the place of the old iron rail—and we have no cause to regret this change. An engineer who has had for a length of time to do with iron eye-bars, and has convinced himself, through tests, of their value, has from time to time met with a lot of bars, sometimes from the most reliable bridge firms, which gave surprisingly bad results; he has, furthermore, among a number of good eye-bars nearly always found a few inferior heads, and if he also recalls to his mind the various fractures in their heads, invariably partly crystalline, often not thoroughly welded and the layers of the piling plates discernible, he will feel little reluctance against trying a new material. The long record of tests of iron eye-bars manufactured for the more important structures of our country shows results which are anything but reassuring, and it is not too much to say that iron eye-bars made by our leading bridge companies under close inspection and with careful tests on the part of the engineer are more unreliable members than any of the rolled or built shapes used in any other part of the bridge. Steel eye-bars have doubtless their weak points also, but we have at least the satisfaction of knowing that the material which we are on the point of abandoning has never satisfied us.

In deciding on the use of steel for eye-bars we have to keep in mind that we deal with a superior, but also with a more sensitive material. To two of the sources of weakness in iron eye-bar heads, *i. e.*, to the effect of unequal heating and to that of chemical impurities, is added the effect of overheating, the proper degree of heat for steel work of any kind being of the greatest importance. The effect of unequal heating is counteracted by the annealing process—by heating the whole bar when completed, but before the final boring of the pin-holes, in a large oven, and then allowing it to cool off slowly. This annealing process is also claimed to restore to some extent the strength of the overheated metal, although I am unable to say how far this claim is justified. As far as chemical impurities are concerned, the influence of too much phosphorus is fatal. Bridge companies have found it necessary to insist on steel containing not over 0.04 phosphorus. The difference between the making of an iron and a steel eye-bar head is characteristic of the two materials. As we have seen, the former is essentially a welding and forging process; the latter is a process by which the heated metal requires merely to be pressed or made to flow into its new shape. Upsetting and shaping, both under hydraulic pressure, with such additional hammering or rolling only as is necessary for a surface finish, suffice to make the steel head. What work is to the iron eye-bar head is heat to the one of steel.

In speaking of steel it is hardly necessary to say that "mild steel" is meant, nor will it probably be disputed that the milder the steel (carbon between 0.10 and 0.20 of 1 per cent.) the more uniformly good the result. The superiority of steel

eye-bar heads, which is proved by the results of tests made so far, is to be accounted for by the homogeneity of the metal: all the doubts about a uniform thorough welding into one fibrous mass, which are so well founded in the case of the iron eye-bar head, are at once removed, and it is in reliance on this difference in favor of steel that the manufacturers, following the example set by the Edge Moor Iron Company, have begun to reduce the size of the steel eye-bar head. It appears now that the investigations and experiments on the best shapes of eye-bar heads, extended through so many years, have had their cause solely in the bad results of unsufficient welding, and that in substituting steel for iron we are justified at once in using smaller heads.

The engineer who builds bridges and who, as is often the case, has no chance to visit some of the principal mills and shops of the country more than once or twice a year, may get bewildered if he considers his responsibility in view of all the requirements for good eye-bars, but the way for him is very simple. He has to insist on full-size tests of a sufficient number of finished bars, thus demanding the results from the manufacturer, who has to assume all responsibility for the success of his work, which, of course, implies that the selection of the material, the mode of manufacture and the shape of the heads have to be left to his discretion also.

I wish to add here the results of full-size tests of steel eye-bars, made last year on the 1,200,000-pound hydraulic testing machine of the Union Bridge Company, at Athens, Pa., for the Grand Avenue Viaduct, now nearing its completion in this city. The steel for these bars is Bessemer steel from the Carnegie, Phipps & Co. mills, Homestead, Pa. The requirements for the specimen tests were: Elastic limit, 32,000 pounds per square inch; ultimate strength, 62,000-70,000 pounds; minimum elongation, 18 per cent., and the specimens ($\frac{1}{4}$ -inch round) to bend 180° around their own diameter without showing crack or flaw.

The record kept at the mill of the chemical tests of each blow shows the amount of carbon to vary from 0.13 to 0.16 of 1 per cent., and that of phosphorus from 0.03 to 0.06 of 1 per cent. The eyes were made at the Edge Moor Iron Works, Wilmington, Del., with an excess of material across the eye over the bar of 40 per cent.

The Roberts Iron Works Company, of Cambridgeport, Mass., have been compelled by increase of business to begin plans for an extension to their boiler works of about 100 feet, making the building 302 feet long by 96 feet wide. The longitudinal seams of the boilers made by this company are made as shown in the following sketch, which is a plan and section through the seam:

1	1	1	1
2	2	2	2
3	3	3	3
3	3	3	3
2	2	2	2
1	1	1	1

The outside lap, through which and the shell the rivets 2 3 pass, is narrower than the inside one through which the rivets 1 1 also pass. It is evident that this construction insures the strength of the shell. Another item in the building of this boiler

is found in the stay-bolts, the bodies of which in the 6-foot boiler are $1\frac{1}{2}$ inches in diameter, while the threaded ends at the heads are $1\frac{1}{4}$ inches, thus reducing the weight of the bolt by doing away with useless material, without diminishing its strength. Under each nut is placed a corrugated copper washer to hold cement. All boilers made by this company are of steel, and are of ample strength for the pressure required.

Treasury Decisions.

TESTS OF MARINE BOILER PLATES.

The Supervising Inspector-General of Steam Vessels, by direction of the Secretary of the Treasury, has issued the following circular governing the test of boiler plates: "Whereas, it has been reported to this office that boiler-makers in many cases prepare sample pieces of steel and iron plate for testing, varying in form from that required by the rules and regulations of the

The Influence of Silicon on Steel.

Professor Tilden, Prof. W. Chandler Roberts-Austen and Mr. F. Turner, who were appointed by the British Association as a committee to investigate this subject, give the results of a series of experiments made in the following manner: A weighed quantity of siliceous metal was melted down in a covered crucible, and about 40 pounds of molten basic Bessemer metal taken from the ladle at about the middle of a cast were then run into the same crucible. After allowing the contents to stand for about a minute the metal was poured into another crucible, and then allowed to slowly solidify. Test pieces were cut from the different samples and submitted to mechanical tests, with the results shown in the annexed table; the chemical analysis is also appended. In the summary of the results it is observed that when silicon is added to iron containing manganese it in nowise injuriously affects the ordinary mechanical properties of the metal, provided the percentage of

ceived—that of Bradlee & Co., of Philadelphia, at whose works the cables are now being made. That these fears were unfounded was shown by a test of three links taken from a completed 2-inch cable and tested on the Watertown machine. The breaking strain was 274,200 pounds, or 10 per cent. more than was needed. The iron for these cables is made by Hughes & Patterson, of Philadelphia. It gives a good weld, is homogeneous and has the required tensile strength.

The links are welded at the ends, which are always the weakest parts, as proved by the break always taking place there. It is more than probable that the action of the Government in increasing the strength of cables will cause manufacturers to abandon the end weld so almost universally used in this country, and adopt the side weld in vogue across the water. In the end weld it is an extremely hard job to perfectly unite the inner surfaces owing to the difficulty of supporting the link on the anvil while striking. This in a great measure would

Number of samples.	Chemical analysis.					Works tests.				Mechanical tests.						
	Silicon. Per cent.	Carbon. Per cent.	Sulphur. Per cent.	Phosphorus Per cent.	Manganese. Per cent.	Rolling.	Hot.	Cold.	Welding.	Limit of elasticity. Tons per square inch.	Breaking load. Tons per square inch.	Ratio of limit to break.	Extension Per cent. on 10 inches.	Reduction of area. Per cent.	Work done per cubic inch. Tons.	Relative hardness.
1	0.010	0.16	0.050	0.060	0.550	{ Roll'd well. }	Good.	Perfect.	Perfect.	22.00	29.64	0.743	23.1	48.8	6.25	Difference so small as to be scarcely perceptible.
2	0.061	0.16	0.028	0.058	0.419	"	"	"	"	22.21	31.61	0.703	20.4	40.7	5.80	
3	0.070	0.15	0.084	0.051	0.500	"	"	Good.	"	21.05	29.51	0.713	22.9	51.5	6.12	
4	0.092	0.21	0.084	0.064	0.634	"	"	Perfect.	"	22.43	33.66	0.666	19.4	44.1	5.82	
5	0.102	0.18	0.028	0.066	0.662	"	"	Good.	"	21.26	33.57	0.634	20.6	51.4	6.06	
6	0.191	0.19	0.064	0.068	0.576	"	{ Good, but rather red-short at welding heat. }	"	"	22.70	31.86	0.712	21.9	43.7	6.31	
7	0.315	0.13	0.028	0.057	0.420	"		"	"	21.29	29.42	0.724	24.8	56.6	6.62	
8	0.247	0.19	0.028	0.074	0.742	"	Good.	"	"	22.23	34.70	0.640	17.6	49.6	5.36	
9	0.320	0.15	0.040	0.081	0.490	"	"	"	"	22.32	33.23	0.671	16.7	36.1	4.96	
10	0.382	0.16	0.042	0.087	0.523	"	"	"	"	24.72	35.67	0.693	18.0	30.7	5.70	
11	0.504	0.18	0.094	0.121	0.455	"	"	{ Broke short at 50°. }	"	26.35	36.72	0.717	19.4	34.8	6.45	

Board of Supervising Inspectors, and that inspectors receive and test the same, not deeming it their duty to object. Such officers are hereby notified that it is their duty to refuse to make tests of boiler material when sample pieces do not correspond, approximately, at least, with the regulations, and in case of the boiler-makers' failure to properly prepare the test-pieces the same should be returned without unnecessary delay, with a letter of explanation giving the reasons therefor. Boiler-makers are informed that the failure of test-pieces to come up to the standard required may be caused from improper manipulation of such pieces, and not from inherent defective qualities in the plates of iron or steel from which the test-pieces are taken, and they are cautioned that any method of cutting off the coupons for testing which requires the sample pieces to be straightened by hammering hardens the material, and is frequently the cause of samples falling short of the required reduction of area required by the rules and regulations, at the same time increasing the tensile strength to a point beyond that which the plates would show if the test-pieces were properly prepared. Coupons should never be sheared, but should be cut off with a planer or chisel. In figuring on the ductility of plate as shown by the reduction of area of section it is not deemed advisable to reject any plate for lack of proper ductility under the rules when such reduction is only a fraction of 1 per cent. short of the standard required by the rules and regulations, as perfectly exact measurement of the broken ends of samples is nearly an impossibility."

silicon does not exceed 0.5. When more than 15 per cent. of silicon is present, both the limit of elasticity and the tensile strength are increased; the extension and the reduction of area are, however, distinctly decreased by the presence of silicon.

Increased Strength of Chain Cables.

Several important changes were made by the United States Government in the last specifications for so-called lightship cables. The most essential was that relating to the breaking strain, which was ascertained by the following formula determined by Lieutenant Mackenzie:

$$\left(\frac{\text{dia}}{4}\right)^2 1,000,000$$

This for a 2-inch cable gives a breaking strain of 250,000 pounds, which is a most decided increase over any of the requirements prevailing in Europe, the highest of which for a similar chain is that of the English Lloyds, where the breaking strain must be 225,000 pounds. The Government also required, for the first time, a breaking test of three links taken at random, and also a test of the whole cable up to one-half of the required breaking strain—that is, the entire length of cable, each of which measures 120 fathoms, must be subjected to a strain of 125,000 pounds in the case of the 2-inch. Eight lengths were called for, two each of the following diameters: $1\frac{1}{2}$, $1\frac{1}{4}$, $1\frac{1}{2}$ and 2 inches. It was not certain that the requirements could be met, and but one bid for the work was re-

be obviated by the adoption of the side weld and should therefore add correspondingly to the strength of the chain.

The Chicago and Aurora Smelting and Refining Company, of Aurora, Ill., have put up a plant for electrolytically depositing copper. The other concerns working in this way are the Bridgeport Copper Company, at Bridgeport, Conn.; E. Balbach & Son, Newark, N. J.; the Chicago Copper Refining Company, Chicago, and the St. Louis Smelting and Refining Company, at St. Louis, Mo.

The accounts of the Foreign Mail Office for the transportation of mails have just been made up, to include the third quarter of the fiscal year. The increase in the quantity of mail exchanged between the United States and foreign countries is shown by the following comparison of the cost of the foreign mail service for the nine months ended March 31, 1888 and 1889:

	1888.	1889.
Transatlantic mails	\$247,744	\$265,593
Transpacific and miscellaneous	75,518	91,683
Panama Railroad	4,962	6,556
Closed mails	19,341	21,488
Total	\$347,565	\$385,320

This shows an increase of 10.82-100 per cent. in the weight of the mails in 1889 over the corresponding period in 1888.

In a letter to the Collector of Customs at New York, dated April 15, 1889, the Treasury Department has held that razor blades without handles possess all the essential parts of razors, and are therefore dutiable at the rate provided for razors.

TRADE REPORT.

Chicago.

Office of *The Iron Age*, 95 and 97 Washington street, CHICAGO, April 27, 1889.

Pig-Iron.—Dealers report a quiet week, with the preponderance of business to the credit of out-of-town buyers. City consumers have their requirements well covered for the immediate future. A better feeling is noted among the local foundries, however, which is caused by an increase in work offering and in sight, but there will have to be a decided improvement in this direction to affect the Pig-Iron market appreciably. Yet sales have been made of Soft Southern Irons at a price which would not have been paid a fortnight since, which would seem to indicate a recovery from the extreme depth of the depression. On the other hand, furnace companies are deferring shipments on a very large part of the orders booked in February and March, their customers requesting this action on account of the falling off in their own business. Room exists, therefore, for a considerable increase in the consumption of Pig-Iron merely to catch up with the contracts already made. Under the circumstances prices of strong Coke Iron are barely holding their own, local brands being still available at rates with which outside Iron cannot compete. Lake Superior Charcoal Iron has been inactive, but large consumers are making inquiries on round lots, and prices will soon be tested. Cash quotations are as follows, f.o.b. Chicago: Local Coke Iron, No. 1, \$16 @ \$16.50; No. 2, \$15 @ \$15.50; No. 3, \$14 @ \$14.50; Chicago and Bay View Scotch, \$16.50 @ \$17; Lake Superior Charcoal, \$19; American Scotch (Blackband), No. 1, \$18 @ \$18.50; Southern Coke, No. 1 Foundry, \$16 @ \$16.25; No. 2 Foundry and No. 1 Soft, \$15.50; No. 3 Foundry, \$15; Gray Forge and No. 2 Soft, \$14.25 @ \$14.50; Tennessee Charcoal, No. 1, \$19; No. 2, \$18; ditto, lower grade, No. 1, \$17; No. 2, \$16; Alabama Car-Wheel, \$25.25.

Bar Iron.—The monotony of the month was relieved this week by the appearance in the market of some manufacturing consumers, who seemed to realize that prices were about as low as could reasonably be expected. One concern placed an order for 1000 tons, largely for early delivery, and others bought fair quantities. Those buyers who were holding back to get the benefit of a reduced freight rate, which they presumed would, as in previous seasons, accompany the opening of navigation, seem to have been victims of false hopes, as the officials of the railroad concerned announce that they do not propose to reduce rates from Pittsburgh and Ohio points to Chicago. Manufacturers also who were quoting prices here for future delivery, based on the expected reduction, and thus depressed values below their normal point, will have to advance their rates if they wish to realize at mill what they expected to get. Small lots from mill are still quotable at 1.60¢ @ 1.65¢, f.o.b. Chicago, half extras, for Common Iron. Store prices are 1.80¢ @ 2¢, according to quantity and quality.

Structural Iron.—Mill lots of Universal Steel Plates are quoted at 2.15¢ @ 2.20¢; Angles at 2.10¢ @ 2.15¢; Tees at 2.50¢ @ 2.55¢, and Beams and Channels at 2.90¢, all f.o.b. Chicago, but a stiffening tendency is developing, owing to the improved condition of the Pittsburgh mills, which have received much business recently from other sections. Beams are in fair demand here, but other classes of structural material are dull. Small lots

from store are quoted at 2.25¢ @ 2.30¢ for Angles; 2.65¢ @ 2.70¢ for Tees, and 3.4¢ for Beams.

Plates, Tubes, &c.—Dealers agree in characterizing the past week as the dulllest of the year thus far. City trade is absolutely lifeless. Yet prices are no lower, as the mills decline to make further concessions. Quotations from store are as follows: Nos. 10 to 14 Iron Sheets, 2.50¢ @ 2.60¢; Nos. 10 to 14 Steel Sheets, 2.75¢ @ 3¢; Tank Iron, 2.40¢ @ 2.50¢; Tank Steel, 2.50¢ @ 2.60¢; Shell Iron or Steel, 3¢; Flange Iron, 4¢; Flange Steel, 3.50¢; Fire-Box Steel, 4.75¢ @ 5.50¢; Ulster Iron, 3.75¢; Boiler Rivets, 3.75¢ @ 4.25¢; Boiler Tubes, 65 % off for 3-inch and over, 62½ % off for 2 to 2½ inch, and 57½ % off for 1½-inch and smaller.

Sheet Iron.—Manufacturers are steadily growing firmer in their views as their order-books fill up, and it looks now as though the quotation of 2.95¢, Chicago, for large lots of No. 27 Common would soon be advanced. Some are refusing to sell beyond July delivery, but others are not so chary of the future and have entered orders freely, covering the whole of the year. Small lots of Common from store are sold on the basis of 3.10¢ @ 3.20¢ for No. 27.

Galvanized Iron.—Manufacturers' agents and jobbers report a dull week. Prices are drooping, and, while quotations for small lots range from 65 % off on Juniata to 65 % and 2½ % off on Charcoal, good buyers are having little trouble in securing more favorable terms. Manufacturers' agents insist that these low prices cannot continue long and that there must soon be a change for the better.

Merchant Steel.—The week has developed a renewed demand for cheap Steel, particularly from the manufacturers of agricultural implements, some of whom have taken advantage of the low prices now ruling to cover their requirements for the fall months. Higher grades are very quiet. Soft Steel Bars are quotable at 2.20¢ rates; Tool Steel, 7.75¢ @ 8¢; Specials, 12¢ @ 25¢; Crucible Spring, 3.75¢; Open-Hearth Spring, 2.50¢; Open-Hearth Machinery, 2.40¢; Sheet Steel, 7¢, 8¢ and 10¢; Tire Steel, 2.20¢ @ 2.25¢.

Steel Rails.—A few small orders have been taken since our last report, but nothing of importance has transpired. Chicago quotations continue at \$30 @ \$30.50.

Track Supplies.—Only occasional sales of small quantities are being made. Steel Fishplates are quoted at 1.80¢ @ 1.90¢ and Iron at 5¢ @ 10¢ less; Bolts with Square Nuts bring 2.55¢ and Hexagon Nuts 2.65¢ @ 2.70¢; Spikes are quoted at 1.95¢ @ 2¢.

Old Rails and Wheels.—Old Rails, both Iron and Steel, are very quiet at present. For Iron Rails sellers ask \$20, but buyers offer only \$19, so that trade is at a standstill. Old Car-Wheels are still falling in price. Consumers would probably have to pay about \$17 for them, but dealers are not willing to pay over \$16. They are being pressed for sale by parties who have become tired of holding them.

Scrap.—The market is flat. Consumers are not buying Wrought even in small quantities, and it is being offered to dealers at very low rates. They are paying \$16 @ \$16.50 for No. 1 Railroad Shop, and proportionate prices for other grades. There is no inquiry for cheap grades of Iron Scrap, and Steel is also very quiet. Cast is in some demand for foundry use, and best quality is quoted at \$13.50 @ \$14 net ton.

General Hardware.—Business is in fair condition, but by no means as active as it has been. Some jobbing houses report a marked decrease in the sales of the last three days. May is usually a good

month, but the prospects are not bright for a very heavy trade in it this year. Some specialties are in very lively demand, however. Bicycles, for instance, are moving off very freely, the supply being unequal to the demand. All kinds of summer Sporting Goods are in almost equally active request, such as Tennis Sets, Baseball Outfits, Fishing Tackle, &c. Ice-Cream Freezers, Refrigerator and other Summer-House Furnishing Goods are also selling well, but in staples there is more or less complaint of dullness. The opening of Oklahoma, which occurred on the 22d, was a boon to the Missouri River jobbers, as they were able to work off a large part of their surplus stocks of Hardware in that direction. Prices are unchanged on most lines. Agricultural Wrenches have been put at 80 % and 5 % discount in case lots, f.o.b. Cleveland, with no freight allowance.

Nails.—A light business is in progress, and prices are a little weaker, though no actual change in quotations has been made. The classification of Wire Nails in kegs at a higher rate of freight, which was alluded to last week, is acknowledged by railroad authorities to have been an error which will soon be corrected. Small lots of Steel Nails sell at \$2, and Wire Nails at \$2.40, with 5¢ off for mixed carloads. The Calumet Iron and Steel Company's P. C. P. Nail is meeting with a very ready sale, notwithstanding the dullness of the general market.

Barb Wire.—Manufacturers are being pressed to make deliveries, and prices are more firmly held, but jobbers still quote small lots of Painted at 2.80¢ and Galvanized at 3.40¢.

The Joliet Steel Company and the Union Steel Company have removed their offices to the Rookery Building. They occupy a larger part of the tenth floor, to which the North Chicago Rolling Mill Company have also removed from their former location on the seventh floor. The offices of all these companies have been arranged in such correspondence with one another that as soon as the formal consolidation is effected on the 1st of May the business of the new Illinois Steel Company will go on smoothly and satisfactorily. A very large number of offices is required to accommodate the official staff and clerical force of this large corporation.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., April 29, 1889.

The fourth month of the year is about closing on a dull a period as any that the Iron trade has experienced during the recent depression. Prices are at the lowest, and sales extremely hard to make; yet in spite of this there is a feeling of confidence that is very remarkable. The idea is that while there may not be much change until after midsummer there must be a great improvement during the fall months, presuming, of course, that nothing of an unfavorable character occurs in the meantime. This feeling is so general that the present condition of things is accepted as a matter of course, and as a necessary preliminary to ultimate improvement.

Pig-Iron.—The market is no better than it was a week ago. Some think it is hardly as favorable as it was at that time. Prices are unchanged, however, and really good Irons are taken without much demur. Outside brands are irregular, and in forced sales may perhaps be a trifle lower, but as a rule there is a disposition to stand out for quoted rates, or pile up Iron until the demand improves. The recent reduction in coal will help local furnaces a little, but it ought not to

affect prices, as they are already much below what they should be to allow a reasonable margin for profit to producers. Still in the event of continued pressure to place Southern Irons in this market it will allow that much more of a rebate without placing the furnace companies in a worse position than they are already in. But the disposition is to look on the bright side, although at the moment there is no doubt that Southern competition is very severe. It is difficult to find out the exact status of Southern Iron as regards the amount sold and prices realized. Some consumers report very favorably as to its quality, others the reverse, but in both cases prices have been in accordance with quality. Hence if some brands of Southern Iron are sold at, say, \$14.50 delivered for Gray Forge or \$16.50 for No. 1 Foundry, it does not follow by any means that all Southern Iron sells at low prices, or that all Southern Iron is of inferior quality. As a rule, however, \$15 and \$17, delivered in consumers' yards, are prices which local Irons have to compete with, although in some instances \$17.50 is paid for certain brands. Local brands are quoted at from \$15 to \$15.50, delivered, for Gray Forge, \$16.50 @ \$17 for No. 2, and \$17.50 @ \$18.50 for No. 1. In some quarters stocks are increasing a little, but as a rule supply and demand are very evenly balanced. There is nothing in the immediate outlook to indicate any special change, so that it may still be called a waiting market.

Blooms.—The market is devoid of special feature, and transactions are nearly all of a routine character, and without change in prices. Sales chiefly at about the following figures: \$28 @ \$28.50, at mill, for Nail Slabs; \$29 @ \$30 for Sheet-Iron Billets; \$30 @ \$31 for Soft Tank, and \$35 @ \$36 for Flange purposes; Charcoal Blooms, \$52 @ \$54; Run-out Anthracite, \$41 @ \$42.50; Scrap Blooms, \$32 @ \$33 1/2 "Bloom" ton of 2464 lb.

Muck Bars.—Quiet but firm. Holders ask \$27, delivered, for good quality Bars, with buyers at \$26.50.

Bar Iron.—Business is dull and prices irregular. Some little attempt at firmness was made a few days ago, and sales were claimed to be at a half-tenth advance; but so many mills have been competing for business that it is doubtful if the increased rate has become general. It is stated, however, that a fair amount of orders has been accumulated for delivery during the incoming month, and that the undertone is stronger and liable to develop rapidly if the movement once gets fairly started. But at present there is nothing like activity, and it will require a good deal of business to give all the mills as large a share as they seem to want. The absence of demand for Skelp Iron is rather severely felt, so that, whatever may be in the future, the present, at all events, is anything but satisfactory to manufacturers. Prices are nominally from 1.75¢ to 1.85¢ for Best Refined Bars, but there is so much cutting in extras that actual prices are much below nominal quotations.

Plate and Tank Material.—As a rule reports from the Plate trade are a little better. Business is more plentiful, and some of the leading mills appear to have all the work they can handle during the coming month. This, with the regular day-to-day trade probably means enough to last until midsummer, even though there may not be in the meantime many more large orders. The outlook is encouraging nevertheless, as large consumers, such as ship and bridge builders, are very busy, and will require a great deal of stuff during the next six months. Prices have not stiffened to any extent yet, although manufacturers are talking that way, and would certainly ask more for deliveries later than May or June.

Prices nominally as follows: 1.90¢ @ 2¢ for Ordinary Plates and Tank Plates; 2.1¢ @ 2.2¢ for Universal Plates; Shell, 2.4¢ @ 2.5¢; Flange, 3.3¢ @ 3.4¢; Fire-Box, 3.5¢ @ 3.7¢; Steel Plates, Tank and Ship Plate, 2.1¢ @ 2.25¢; Shell, 2.7¢; Flange, 3¢ @ 3 1/4¢; Fire-Box, 3 1/4¢ @ 3 1/2¢.

Structural Iron.—A fair amount of activity is reported in this department, and mills have all their capacity moderately well engaged for some time to come. There is unquestionably a great amount of work to be done in the near future, although there may be delays before it can be got under way. The outlook is on the whole considered favorable, although prices are low and margins narrow. Nominally quotations are about as follows: Bridge Plate, 2¢ @ 2.1¢; Angles, 1.95¢ @ 2¢; Tees, 2.4¢ @ 2.6¢; Beams and Channels, 2.8¢ for Iron or Steel.

Sheet-Iron.—Reports from this branch of the Iron trade are on the whole decidedly favorable. A great deal of business has been taken, while the continued inquiry from dealers and consumers indicates a good demand in the near future. Prices are steady, with some approach to firmness at about the following figures for carload lots:

Best Refined, Nos. 14 to 20.....	3¢
Best Refined, Nos. 21 to 24.....	3.20¢
Best Refined, Nos. 25 to 26.....	3.40¢
Best Refined, No. 27.....	3.50¢
Best Refined, No. 28.....	3.60¢
Common, 1/4¢ less than the above.	
Best Soft Steel, Nos. 14 to 20.....	3 1/4¢
Best Soft Steel, Nos. 21 to 24.....	3 1/2¢
Best Soft Steel, Nos. 25 to 26.....	3 3/4¢
Best Soft Steel, No. 27.....	4¢
Best Bloom Sheets, 1/4¢ extra over the above prices.	
Best Bloom, Galvanized, discount.....	.65 %
Common, discount.....	.67 1/2 %

Steel Rails.—The market is dull, although prices are held with some degree of firmness. Sales are chiefly in small lots at about \$28, at mill, and manufacturers claim that the order would have to be something very desirable to secure attention at less money. The demand for Steel in other forms is an important feature, so that, on the whole, mills are doing much better than would be supposed. Reports from other markets are to the effect that \$27, at mill, has been shaded for Rails, but they may refer to transactions made some time ago.

Old Rails.—There is very little demand at present, so that prices are nominal at about \$22 bid for spot T's, and \$23 asked. Latest transactions were at medium figures.

Scrap Iron.—The market is dull, but prices are nominally as before, viz.: \$20 @ \$21 for cargo lots; \$21 @ \$21.50 for carload lots, delivered, or for choice, \$22; No. 2 do., \$14 @ \$15; Turnings, \$14 @ \$15; Old Steel Rails, \$18 @ \$19; Cast Scrap, \$15 @ \$16; do. Borings, \$9 @ \$10; Old Fish Plates, \$23 @ \$24; Old Car-Wheels, \$17 @ \$18, Philadelphia.

Pittsburgh.

Office of The Iron Age, 77 Fourth Ave.
 PITTSBURGH, April 29, 1889.

There has been a considerably increased volume of business in Raw Iron this week. In regard to the near future of the Iron trade there is a diversity of opinion. Some well-informed operators look for business to improve as the season becomes more advanced, while others who look chiefly on the dark side see nothing very encouraging in the near future.

The wage scale will have to be renewed again on the 1st of July, and already the matter is being agitated. Mill owners, it is evident, will demand a reduction, and it will no doubt be resisted, but it is to be hoped that it will be adjudicated without a strike. Pittsburgh mill owners claim

they are paying entirely too much for puddling, &c., as compared with the wages paid east of here for the same kind of work, and that they are in justice and equity entitled to a reduction in the wage scale, but how the Amalgamated Association will view the matter it is difficult at this time to foretell.

The strike at the Rail mill of the Allegheny Bessemer Company still continues; it may be settled within the next 24 hours, and it may hold out for several weeks. Thus far the strike has been conducted on the part of the strikers in as orderly and law-abiding manner as could be expected; there has been but little or no violence, but a very strong pressure has been brought to bear on men who have been secured by the company and sent to the works with a view to starting up. It is thought that enough men will be secured to start up the mill on Monday next. The company have a number of contracts booked, but they are subject to the strike clause, and no great loss will be experienced thereby.

Freight rates on Iron have been reduced on the lines of the Pennsylvania Railroad Company from the Mahoning and Shesango valleys and Wheeling to Pittsburgh, from 80¢ to 65¢ per ton. This may be traceable in part, possibly, to the strong criticisms of Andrew Carnegie upon the policy of the Pennsylvania Railroad toward Pittsburgh, although the demand for the reduction in question, if we mistake not, was made before. This matter of transportation is of vital importance to our Pittsburgh manufacturers, as in these days of very close margins a freight rate frequently determines whether an order is to be placed here or elsewhere. It is not believed that the management of the great corporation in question intentionally discriminates against Pittsburgh, but our manufacturers generally aver that they have not received the treatment they are entitled to, in view of the immense business they give that company. The refusal of the company to give rebates is to be commended.

Pig-Iron.—There has been a considerably increased volume of business the past week, but at a reduction in prices. The reduction in freight rates has been to a considerable extent offset, so far as valley furnacemen are concerned, by the decline in price, and the consumer gets nearly all the advantage resulting therefrom. In other words, while the valley furnacemen gets a reduction of 15¢ in transportation, he has been compelled to knock 25¢ per ton off the price of his product in order to sell in this market. Sales of some 6000 tons Gray Forge at \$14, cash; 1500 tons do. at \$14.50, four months, and 1000 tons No. 1 Foundry at \$16.80, cash. The general feeling at present is that \$14, cash, is hard pan for standard brands of mill, but this time will determine. At all events, it is nearer hard pan if it has not not reached there. Bessemer, of which there were no sales reported, is quotable at \$16.25, cash. There appears to be more inquiry for Foundry Irons. Quotations may be fairly given as follows:

Neutral Gray Forge.....	14.00 @	cash
All-Ore Mill.....	15.25 @	\$15.75,	"
White and Mottled.....	13.00 @	13.50,	"
No. 1 Foundry.....	16.50 @	16.75,	"
No. 2 Foundry.....	15.50 @	16.00,	"
No. 3 Foundry.....	14.75 @	15.00,	"
No. 2 Charcoal Foundry.....	21.00 @	22.00,	"
Cold Blast Charcoal.....	25.00 @	28.00,	"
Bessemer Iron.....	16.25 @	"

Muck Bar.—There has been more activity, but the market continues weak, in sympathy with Pig-Iron. Within the past week or two there has been a decline of 50¢ to 75¢ per ton. We can report sales of 1500 tons at \$26.25, cash; 2000 do. at \$26, cash, and 1000 do., at \$26, cash. It is claimed that there is not much profit in converting Pig-Iron into Muck Bar at \$12 per ton.

Spiegel—Is firmer, and is now quoted at \$30 @ \$30.50, cash, for 20 %. Ferro-manganese remains as last quoted—\$58 @ \$58.50 for 80 %.

Manufactured Iron.—The Merchant Iron trade continues light for the season, but there are hopes of an early improvement; not only is the demand light, but prices are unsettled and unremunerative. For strictly first-quality Iron prices may be quoted upon a basis of 1.60¢ to 1.70¢ for Bars, 60 days, 2% off for cash, but valley mills are offering Old Rail Iron as low as 1.40¢ @ 1.50¢. There is considerable inquiry for Skelp Iron, and some of the mills have all they can do. Grooved is quoted at 1.62½¢ @ 1.65¢ and 1.90¢ for Sheared.

Nails.—The Nail trade here continues very dull, and there does not appear to be much prospect of any immediate improvement. Prices are quoted at \$1.85 @ \$1.90 for 12d to 40d, 60 days, 2% off for cash. Wire Nails, for which there is a demand, are quoted in car lots at \$2.20, 60 days, 2% off. Manufacturers of the latter are making a strong effort to supplant the Cut Nail, and they are meeting with considerable success.

Wrought-Iron Pipe.—The Pipe mills are pretty fully employed, some of them having orders enough booked to keep their mills going most of the summer; as stated in our last report, the demand thus far has been chiefly for large-sized Pipe, but there will no doubt be an improved inquiry for the smaller sizes later on in the season. Combination prices are being faithfully adhered to. Discounts on Black Butt-Welded Pipe, 55 %; on Galvanized do., 47½ %; on Black Lap-Welded, 67½ %; on Galvanized do., 55 %; Boiler Tubes, for 2 to 2½ inch, inclusive, 62½ % off; Casing, 5½-inch, 62½ % off; other sizes, 60 % off; 2-inch Tubing, 13¢ per foot, net; 6-inch Line-Pipe, 53¢; 8-inch, 90¢.

Old Rails.—Old Iron Rails continue dull, and in the absence of sales may be quoted nominally at \$22.50, cash, at which last sale reported was made. The offerings are not large, but for the time there appears to be little or no inquiry. There is a good demand for Old Steel Rails, and prices are steady; 700 tons short lengths sold at \$17.25 and 200 tons long lengths at \$19.50. Until quite recently Old Iron Rails sold much more readily than Old Steels, but now it is different.

Steel Rails.—Heavy sections are still quoted at \$26 @ \$27, cash, at mill, according to size of order and delivery. The Edgar Thomson Works are running right along and pretty well up to their full capacity; but the mill at Duquesne, as noted elsewhere, is standing idle, owing to strike of employees.

Blooms, Billets, &c.—Bessemer Steel Billets and Blooms are quoted at \$27 @ \$27.50, cash, at makers' mill; do. Nail Slabs, \$26.50 @ \$27. Owing to the depressed condition of the Nail trade there is not much inquiry for Slabs, which, if we mistake not, are lower than ever before. Domestic Bloom and Crop Ends quoted, in absence of sales, at \$17.50 @ \$18. The last sale of the former reported was at \$18.

Railway Track Supplies.—No change in prices. Spikes, 2¢, 30 days, f.o.b. cars at works. Splice Bars, 1.70¢ @ 1.75¢; Track Bolts, 2.75¢ with Square and 2.85¢ with Hexagon Nuts.

Old Material.—The demand for all kinds of Old Material continues light, and there has scarcely been enough doing of late to establish prices, which we quote nominally as follows: No. 1 Wrought Scrap, \$19, net ton; No. 1 Wrought Turnings, \$13; Old Car Axles, \$24 @

\$25; Cast Scrap, \$14 @ \$15, gross ton; Cast Borings, \$11 @ \$12; Old Car-Wheels, nominal, \$19

Louisville.

LOUISVILLE, KY., April 27, 1889.

The market continues dull, and there has been little change during the past week. Several large transactions are on the point of being closed, provided furnaces will sell for deliveries desired. There is no change for the better, and prices remain low, with little prospect of a speedy advance. All grades appear quiet, and consumers are able to make purchases to meet their views with little trouble. The policy of consumers appears to be as fast as they make contracts to cover with purchases of Iron, so that when the real advance takes place they will be benefited by it. We quote as follows:

Southern Coke, No. 1 Foundry, new classification.....	\$14.75 @ \$15.25
Southern Coke, No. 2 Foundry, new classification.....	14.25 @ 14.75
Southern Coke, No. 3 Foundry, new classification.....	13.75 @ 14.25
Gray Forge.....	13.25 @ 13.75
White and Mottled, different grades.....	12.75 @ 13.25
Silver Gray, different grades.....	13.00 @ 13.50
Southern Charcoal, No. 1 Foundry.....	16.25 @ 16.75
" " No. 1 Mill.....	14.75 @ 15.25
Southern Car-Wheel, standard brands.....	21.75 @ 22.75
Southern Car-Wheel, other brands.....	18.00 @ 19.50
Hanging Rock Coke, No. 1 Foundry.....	15.50 @ 16.00
Hanging Rock Charcoal, No. 1 Foundry.....	19.50 @ 21.00
Hanging Rock, Cold Blast.....	20.75 @ 22.75

Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts., CHATTANOOGA, April 20, 1889.

Pig Iron.—The condition of the market and the movements of Iron are practically unchanged since the last report; there seems to be a market for all the Iron that is being turned out, as there is but little being stacked at such furnaces as are disposed to take the market rates for their output, which is the case with most of them. The demand seems to come from all quarters of the United States, from single carloads up to 100 and 500 ton lots, and most orders are for quick shipments. There are some sales being made for large round lots, but it appears to be generally understood that these are for speculative purposes, as some of these purchases are being filled up at the furnace yards. We note sales of 1000 tons No. 2 of a favorite brand at \$12, cash, at furnace yard, to be so disposed of, and learn that quite a number of other lots are being so placed. Upon the whole there appears to be but little animation manifested in any of the Pig-Iron producing centers, but rather a waiting for something to turn up. In the meantime it appears to be generally conceded that prices will not at present advance, and it is quite certain that they cannot well go lower.

Cleveland.

CLEVELAND, April 27, 1889.

Iron Ore.—Nearly all the mining companies have made fair sales during the past week, the aggregate amount of ore sold since the last report probably aggregating 300,000 tons. Buyers are asking for Gogebic Bessemer this week and several large blocks will be sold within the next few days at an average price of about \$5.25 per ton. Considerable Ore from the Chapin Mine has been sold to furnacemen along the Lehigh Valley Road at prices varying from \$5.10 to \$5.25, f.o.b. vessels Buffalo. Ores from the Champion and Republic mines are still bringing \$5.75 readily and Minnesota Ores are in good demand at the same figures. Nearly 80,000 tons of new Ore have been unloaded at Cleveland, Ashtabula and Fairport

during the past week. The Ore men are having no difficulty in engaging tonnage at 90¢ from Escanaba, \$1.10 from Marquette and \$1.25 from Ashland and Two Harbors.

Pig-Iron.—There is a little more inquiry than was noticeable a week ago, but the prices realized for the small lots reported sold are too vacillating and indefinite to base reliable quotations upon. An improvement is expected whenever these scattering sales, grouped together, cause a scarcity. Furnace agents do not seem to be attempting to force business, contenting themselves with waiting a week or two longer for the hoped-for change in the situation. Foundry Irons are more affected by the present depression than are the better brands of Gray Forge, for which a light though continued inquiry is reported.

Manufactured Iron.—The demand is not heavy, and Bars are quoted at 1.60¢ @ 1.70¢, 60 days, 2% off for cash, for carload lots from mill. Sheets are firmer.

Odd Rails.—The market is far from active. A surplus of Old Wheels is reported, and Old American Rails do not command over \$21.50.

Cincinnati.

Office of *The Iron Age*, Fourth and Main Sts., CINCINNATI, April 20, 1889.

Pig-Iron.—Business in Pig-Iron here during the week under review has been dull, yet there has been a number of small orders for carload and 50-ton lots, which in the aggregate make a not unfavorable showing. A few 1000-ton lots are also reported by a few agents and dealers, among them being 1000 tons Gray Forge Iron on a basis of \$13, cash, here. The regular price for No. 1 Southern Foundry Iron is \$14.75 @ \$15, with the outside rates an extreme, and only small sales at these rates. No. 2 Southern Foundry has been offered at \$14.25 @ \$14.50, the outside rate for small amounts. A special sale for June, July and August delivery has been made during the week consisting of 2000 tons No. 1 Foundry, at \$15.40, and 2000 tons No. 2 do., at \$14.40, on time. Mottled Iron has continued heavy and depressed, and Car-Wheel grades have remained neglected. The following are the approximate prices current here at the close, for cash, f.o.b.:

Foundry.	
Southern Coke, No. 1 (new classification).....	\$14.75 @ \$15.25
Southern Coke, No. 2 (new classification).....	14.00 @ 14.50
Southern Coke, No. 3 (new classification).....	13.50 @ 14.00
Ohio Soft Stone Coal, No. 1.....	15.50 @ 16.00
Ohio Soft Stone Coal, No. 2.....	14.50 @ 15.25
Mahoning and Shenango Valley.....	16.50 @ 17.00
Hanging Rock Charcoal, No. 1.....	21.00 @ 22.00
Hanging Rock Charcoal, No. 2.....	19.00 @ 22.00
Tennessee and Alabama Charcoal, No. 1.....	18.00 @ 18.50
Tennessee and Alabama Charcoal, No. 2.....	17.00 @ 18.00
Forge.	
Strong Neutral Coke.....	13.25 @ 13.50
Mottled Neutral Coke.....	12.00 @ 12.50
Gray Forge.....	13.00 @

Car-Wheel and Malleable Irons.	
Southern Car-Wheel.....	20.00 @ 25.00
Hanging Rock, Cold Blast.....	22.00 @ 25.00
Lake Superior Car-Wheel and Malleable.....	20.50 @ 21.50

Manufactured Iron.—There is no improvement in the demand for Manufactured Bar or Structural Iron and an easy tone has continued to prevail, but prices are without quotable change.

Nails.—The market has been a little irregular in tone and the demand has been only moderate. 12d @ 40d sell at \$1.90 @ \$1.95 per keg, with 10¢ rebate in carload lots at the mills. Steel Nails sell at \$1.90 @ \$1.95, and Steel Wire Nails at \$2.45 @ \$2.50 per keg.

Old Material.—The demand has been light and a weaker tone has prevailed, but there has been no pressure to sell. Old

Rails have remained dull, but it is difficult to obtain desirable lots under \$20, cash. Buyers of Old Wheels have reduced their limits to \$17.50, but there are few sellers under \$18, spot cash.

New York.

Office of *The Iron Age*, 66 and 68 Duane street, New York, April 29, 1889.

American Pig.—The only feature of any interest during the week under review has been the report that Southern Iron has been offered both at Boston and in this market at \$16 for No. 1. The quotation in the New England market is particularly low, since the cost of delivery to that point is nearly \$1 higher than it is to New York from the Southern furnaces. It should be stated, however, in connection with these low offerings that they emanate exclusively from new companies, who are introducing their Iron and naturally find it necessary to make concessions. While the quantity that is offering is naturally small, and the pressure to sell can only be temporary, it is nevertheless having its effect upon the market, which is weaker. We continue to quote Northern standard brands \$17.50 @ \$18 for No. 1, \$16.25 @ \$17 for No. 2, and \$15 @ \$15.25 for Gray Forge. The latter is difficult to sell, and if wanted could be bought at \$14.50, at tidewater.

Spiegeleisen and Ferromanganese.

—No transactions of any consequence are reported, but the offerings of a number of large blocks have caused a weakening to \$27.25 as sellers' figure, which buyers do not approach. We quote, Ferromanganese \$56 @ \$56.50, ex-ship.

Structural Iron and Steel.—We continue to quote: Sheared Plates, 1.9¢ @ 2¢; Universal Mill Plates, 2¢ @ 2.1¢; Angles, 1.9¢ @ 2.1¢; Tees, 2.35¢ @ 2.5¢, and Channels and Beams, 2.8¢, on dock.

Plates.—We quote Iron Tank, 1.9¢ @ 2.2¢; Shell, 2.25¢ @ 2.4¢; Steel Tank, 2.15¢ @ 2.25¢; Shell, 2.35¢ @ 2.4¢; Flange, 2.55¢ @ 2.75¢, and Fire-box, 3¼¢ @ 4¢.

Bar Iron.—For large lots, Common is being offered at 1.55¢, delivered. The market remains dull. We quote: Carload lots on dock, Common, 1.6¢ @ 1.65¢; Medium, 1.65¢ @ 1.7¢, and Refined, 1.7¢ @ 2¢.

Steel Rails.—Pittsburgh has again become a storm center, a recent large sale in that market having been made at \$26, if reports generally current are to be credited. An additional feature causing weakness is the offering by brokers of two 10,000-ton lots, bought on speculation from a new mill. The only sales reported during the week have been 2500 tons by an Eastern mill at private terms, and about 2000 tons, Anniston delivery, by a Pittsburgh mill. There are a few large Southern orders still in the market, but in the case of at least one of them the financial standing of the purchasers and the conditions offered are not such as to induce much rivalry for the business. The vigorous competition between the Pittsburgh mills has created a good deal of uneasiness, and it is reported that the rail-makers will soon hold another meeting to discuss the situation. In the meantime, the market is unsettled, with \$27 @ \$27.50 the usual quotation. The lower figure, however, might, under exceptional circumstances, be shaded.

Old Rails.—The market is dull, the quotations remaining nominally \$22.50 @ \$23.

Rail Fastenings.—Some of the recent contracts taken for Rail Fastenings have been at exceptionally low figures; thus \$1.70 has been made for Angles, delivery at Toledo, the seller being a Western mill,

while an Eastern mill has named \$1.60, delivery at Boston. Spikes continue demoralized at \$1.90 @ \$2.

Messrs. Witherbee, Sherman & Co. have moved their offices to the Bank of America Building, Wall street.

The American Pig Iron Storage Warrant Company occupy new offices on the fourth floor of the Bank of America Building, Wall street.

The Joliet Steel Company, A. T. Shoemaker, agent, has removed to the Bank of America Building, Wall street.

Financial.

Yielding to the pressure of an all-pervading national sentiment, the volume of business for the current week is necessarily curtailed, and the record of transactions, for the same reason, is partial and fragmentary. The report that the Senate and Assembly had concurred in a resolution to make Monday and Wednesday of this week legal holidays was received with much satisfaction by most of the members of the several exchanges, and generally in other commercial circles. The feeling seemed to prevail that the Governor would sign the bill, thus creating an unbroken succession of legal holidays from Saturday at noon to Thursday at 10 o'clock in the forenoon. Some inconvenience is likely to arise, but no serious trouble. The Canal Commissioners give notice that the Erie Canal will open in its entire course May 4, and from Buffalo to Utica May 1. All along the line of the lakes and canals the season will open remarkably early. Some uneasiness exists in commercial circles, arising from an effort to induce Secretary Windom to abandon the proposed site for the appraiser's stores in this city. The monthly report of the Bureau of Statistics was favorable far beyond expectations, showing the exports of merchandise for March to have been \$69,114,358, which is nearly \$19,000,000 more than they were for March, 1888, and considerably more than they have been during any March since the present tariff act has been in operation. The imports for March also show a gain, being \$66,281,032, or \$3,000,000 more than they were in March, 1888, and also more than they have heretofore been in March of any year since 1883. While few ventured to predict that the exports for the month would equal the imports, an excess of more than \$7,500,000 in the balance of trade was wholly unlooked for, and this against an adverse balance of \$11,000,000 a year ago. For nine months the favorable balance is \$62,452,863, and this gratifying feature in the financial situation is well calculated to add zest to the centennial ovation.

The Stock Exchange markets were without notable feature until Thursday, when the brisk demand, both for stocks and bonds, influenced very considerably by higher prices in London, together with a plethora of money and improved foreign trade reports, occasioned a sharp advance. The chief interest centered in the bond market. There were occasional slight reactions due to realizations and bearish pressure, but the recoveries were prompt, and the market was strong at the close. There was more or less realizing on Friday, but the tone was strong on Saturday, and comparisons show a general gain in prices for the week.

United States bonds are quoted as follows:

U. S. 4½s, 1891, registered.....	108½
U. S. 4½s, 1891, coupon.....	108½
U. S. 4s, 1897, registered.....	120½
U. S. 4s, 1897, coupon.....	120½
U. S. currency 6s.....	121

The bank return for the week shows an increase of \$1,340,300 in surplus reserve, which now stands at \$13,426,950. The

loans are contracted \$982,900; the specie is decreased \$849,800; the legal tenders are up \$2,201,800; the deposits other than United States are increased \$46,800.

The exports of specie were for the week \$1,794,000, and the imports \$167,000. The imports of merchandise were valued at \$9,574,000, of which \$2,000,000 represents dry goods.

The money market was easy, time money being available at low rates in amounts in excess of the demand. For three to four months the quotations were 2½ @ 3%, and for longer periods 3 @ 3½%. Commercial paper was in good demand, with small offerings.

The market for sterling was dull and a shade easier. There was an increased supply of security bills. Posted rates closed at \$4.88 @ \$4.90.

The general markets were unusually quiet, aside from fluctuations of a speculative character. Sugar again advanced, granulated now selling at 8½¢ 7 lb, as compared with 7¢ in March, when the advance commenced. Sugars for which the refiners now charge 8½¢ cost them in the raw state 7½¢. Formerly ½¢ was the average margin between the market price of raw and refined sugar. Cotton is stronger, but wheat, flour, provisions and some other commodities betray weakness. Among dry-goods jobbers there is an expectation of more business after the holidays. New York prices of wheat on Saturday were 83¼¢ for May, 84¼¢ for June, 86¢ for July and 89¼¢ for December, as against a week ago of 84¼¢ for May, 85¢ for June, 86¼¢ for July and 89¼¢ for December.

Metal Market.

Copper.—Since our last weekly report spot Copper advanced in the London market from £36. 17/ to £38. 5/, and futures from £37 to £38. 5/, at which it wound up strong yesterday, sales aggregating 1375 tons. Intimations were privately cabled from the other side, it appears, that negotiations between the representatives of mines and the parties interested over there are proceeding more smoothly, so that ere long an understanding may be reached. This may perhaps explain the greater buoyancy in London, or the latter may simply be due to the covering of bears. Paris, meanwhile, cabled April 27: "The report of the receivers of the Comptoir d'Escompte says that by prudent realizations the assets of the concern will probably yield a surplus of 6,000,000 francs. The report also indicates the manner in which shareholders may enforce their claims on the personal estate of the late M. Denfert-Rochereau. The new Comptoir d'Escompte will begin operations on May 1." Nothing in the way of actual business meanwhile transpired in our market. For Lake 14¼¢ is offered and 15¼¢ asked. We understand that some of the leading interests are advocating the fixing of the price between 12¢ and 13¢, with the probability that the former will be adopted.

Tin.—Tin has been on the downward track again in London, giving way since we last reported from £92. 10/, spot, to £91. 5/ and futures from £93. 2/6 to £92. 2/6 yesterday, sales summing up 460 tons in the meantime. Here greater activity developed, 10 tons spot being sold at 20.65¢; 20 tons May at 20.50¢; 10 tons June at 20.60¢; 10 tons July at 20.60¢; 10 tons August at 20.65¢, and 10 tons September and 10 tons October, also at the latter figure; subsequently the downward course of the London market unsettled ours, spot being easy at 20¼¢; July at 20.40¢, and 10 tons October being parted with at 20.55¢. The market closes in New York at 20¼¢, spot, at the Metal Exchange; 25 tons prompt shipment brought 20.40¢. **Tin-Plates.**—There is no change here, and the

EAST INDIES.

MANILA, April 22, 1889.—*Hemp*.—There are buyers at \$12.50, against \$8.25 same date last year, equaling 50 ton, cost and freight, £42. 17/6, against £28. 15/6. No clearances are reported for the United States since last cable, against 14,000 bales in 1888. Since January 1, 105,000 bales, against 57,000; loading for ditto, 11,000, against 16,000; cleared for England since January 1, 87,000 bales, against 107,000; loading for ditto, 8,000, against 14,000; cleared for all other ports, 12,000, against 25,000; receipts at all ports since last cable, 11,000, against 8,000, and since January 1, 211,000 bales, against 184,000 in 1888 and 139,000 in 1887. Freight, \$7.50, against \$5. *Exchange*, six months' sight, 3/7, against 3/6 1/2.—*Ker & Co.*, per cable to their agent in New York. *Mr. Charles Nordhaus*, 89 Water street.

COLOMBO, Ceylon, March 14, 1889.—*Plumbago*.—Dealings for export have been restricted for the week to small parcels at ensuing quotations in rupees 50 ton: Large Lumps, 145 @ 170; Ordinary Lumps, 125 @ 160; Chips, 80 @ 95, and Dust, 40 @ 65. Amounts exported to date since October 1 have been as follows: To England, 54,901 cwt.; to Hamburg, 5418; to Antwerp, 5101; to Bremen, 659; to Holland, 437; to India, 63; to Australia, 88, and to the United States, 63,727; together 130,394 cwt., against 114,527 in 1888, 102,712 in 1887, and 81,641 in 1886. *Exchange*, six months' sight, 1/4 27-32.—*Volkart Bros.* to their agent, *Mr. John W. Greene*, 82 Wall street.

SOUTH AFRICA.

PRETORIA, Transvaal, March 21, 1889.—*Silver*.—Rich Silver ores have been discovered in our immediate vicinity on the Middleburg-Barberton road, and several mining companies have been started here and in Johannesburg. Shares are to be placed in the European markets.—*Argus*.

RUSSIA.

ODESSA, April 15, 1889.—*Petroleum*.—The formation of a company is planned at Baku for the purpose of pushing the export of Naphtha and Petroleum to Chinese, Japanese and Siberian ports. *Entrepôts* of refined Petroleum are to be created well furnished with lamps suitable for its use at Vladivostock and Petropawlosk, whence it is to be shipped to branch establishments in China, Japan and East Siberia. Shipments of Russian Petroleum in tank steamers to England reached the equivalent of 143,474 barrels since January 1, as compared with 36,259 last year. During the same period last year the United States have shipped to England 181,449 barrels, and this year 168,867 barrels.—*Commercial Gazette*.

SPAIN

BILBAO, April 6, 1889.—*Iron Ore*.—The bad weather has checked activity in Ore dealings on the spot, the comparatively little done being at 7/ @ 7/4 Rubios and 8/4 @ 8/8 Campanil, the latter still tending upward, owing to its growing scarcity. There are steamers in port of a joint capacity of 80,000 tons chartered to load Ore. Freighters are drooping still further. The total export of Ore hence to date aggregates 1,081,654 tons, against 1,024,858 tons same time last year. *Pig-Iron*.—There were shipped during the week 3193 tons abroad and 1117 coastwise. The spot quotation of the Vizcaya Company's Pig-Iron is 60 @ 65 francs 50 ton, f.o.b., to arrive (deliverable at any time in 1889), 58 @ 62.50, analysis guaranteed. During the first quarter the Altos Hornos Company exported 3027 tons of Pig-Iron; the Mudela, 4618, and the Vizcaya, 13,565; together, 21,210 tons, against 17,268 in 1888.—*Bilbao Marítimo y Comercial*.

GERMANY.

HAMBURG, April 20, 1889.—*Iron*.—The Rhenish Westphalian Pig-Iron market has continued active, but the latter less so for export. Americans were ready to take large lines for forward delivery, but makers were not disposed to sell so long ahead at ruling rates. Now this demand revives on a large scale, but if Americans want any they will have to submit to an advance should the English market continue firm. The present price on the spot remains 63. An advance of 2 marks 50 ton is asked for deliveries of Forge Pig during the last quarter of the year; the present figure is 55 to 57. English Bessemer on the West Coast commands 49/-, an improvement of 1/-. Finished Iron for home use is doing well, but not for export. The most active articles are Beams, for which the demand increases daily, and Boiler Plates. The advance of \$1 in Wire Rods in America causes a better feeling therein. There is no change in other products in the Iron and Steel branches.—*Borsenhalle*.

The sales of bunting in New York for decorative purposes during the past week have been enormous. According to one estimate the expenditure on this account will amount to \$1,500,000.

Wages in 1800.

The following extract from "McMaster's History," showing the condition of the working classes nearly a century ago and the rate of wages then prevailing, will be found of more than usual interest to mechanics of the present day:

The condition of the wage class of that day, 1800 (A. D.), may be well examined. It is full of instruction for social agitators. In the great cities unskilled workmen were hired by the day, bought their own food, and found their own lodgings. But in the country, on the farms, or wherever a hand was employed on some public work, they were fed and lodged by the employer and given a few dollars a month. On the Pennsylvania canals the diggers ate the coarsest diet, were housed in the rudest sheds, and paid \$6 a month from May to November and \$5 a month from November to May. Hod-carriers and mortar-mixers, diggers and choppers who, from 1793 to 1800, labored on the public buildings and cut the streets and avenues of Washington City, received \$70 a year, or, if they wished, \$60 for all the work they could perform from March 1 to December 20.

The hours of work were invariably from sunrise to sunset. Wages at Albany and New York were 3 shillings, or, as money then went, 40 cents a day; at Lancaster, \$8 to \$10 a month; elsewhere in Pennsylvania workmen were content with \$6 in summer and \$5 in winter. At Baltimore men were glad to be hired at 18 pence a day. None by the month asked more than \$6. At Fredericksburg the price for labor was from \$5 to \$7. In Virginia white men employed by the year were given £16 currency; slaves when hired were clothed and their masters paid £1 a month. A pound, Virginia money, was, in Federal money, \$3.33. The average rate of wages the land over was \$65 a year, with food and perhaps lodging. Out of this small sum the workman must, with his wife's help, maintain his family.

Hardware in England.

From discussions which are carried on in the English trade journals it is evident that Hardwaremen are to a greater or less extent embarrassed by the competition of co-operative stores and merchants in other lines who offer to their customers a variety of goods which have been regarded as legitimately belonging to Hardwaremen. The London *Ironmonger*, in a recent issue, contains answers to inquiries as to the extent to which ironmongers are affected by the competition of the London or local co-operative stores or by competition of drapers, tea shops, &c., and as to the best and surest way of successfully meeting the competition and cutting of the stores, drapers, tea shops, &c. From these replies we make the following extracts, which, aside from their bearing on the question under discussion, will be of interest as reflecting more or less fully the conditions under which English Hardwaremen are carrying on their business:

In the first place, buy and sell as much as possible for cash; encourage ready-money sales by allowing 5 per cent. on all transactions above, say, 10 shillings; sell all leading articles very cheap, and ticket them up in your shop and windows; keep windows clean and tidy and make them attractive—50 per cent. of the ironmongers' shop windows are a disgrace to the trade; fill a whole window occasionally with special or seasonal goods—at present there should be a good display of Garden Tools and Implements. In the second place, see that you give no employment whatever to any one connected with a co-operative store, as they only make use of you to suit their own ends, but employ those only who believe in individual enterprise—they, being your own customers, are entitled to the first claim upon you; speak and write very plainly to manufacturers; let them understand that you will not

ers on this subject, and ask them to do all in their power to discourage this movement, which has now become so great a hindrance to buy goods which you know to be made almost wholly by co-operators. Many manufacturing districts which could be easily named are now almost wholly given up to co-operation, and some towns are now completely ruined for business. If this leveling-down system is allowed to go on at the same rate that it has been doing for some time past very soon there will be little use for either manufacturer or merchant. Individual effort against this and other injustices to the trade is very good so far as it goes, but without united action little can be done. Almost every trade has got its association for self-protection. Why not the ironmongers?

If capital is available, make a big show and go in for novelties; but this must not be done unless with a firm determination to carry it through, and get a name for cheapness whether you are cheap or not. How this is done I have not yet found out.

Do your business on the same lines as stores, &c. I always endeavor to impress on customers who I know deal at stores that any article can be supplied at the same rates and price for cash, and never let it be thought for one moment that you can be beaten in fair competition.

If it were only a question of prices it might be met; but the prejudices of the people are to be overcome. One way is persistent advertising and comparing store prices with that of your own. Another is to have nothing to do with those houses that supply the stores, as in three cases out of four it is not done fairly. I also think there should be more interchange of opinions in conversation among ironmongers themselves on the matter.

The mischief has become chronic and will be difficult to alter now. The trade guilds of centuries ago would come in useful now if revived. Other agencies are also working fatal mischief to the ironmonger. Thus, wholesale houses are open to receive orders from architects, agents of estates and private individuals, and quoting discount at almost the same rate as to the ironmonger, so that the latter has to compete directly with the producer, and must give up the greater part of his discount or lose the order.

Labor in the New York Prisons.

Machinery will again be employed in the State's prisons of this State if the Fassett bill becomes a law, of which there now seems to be a strong probability. Only by a very close vote in the Assembly was the State saved from the burden of taxation and demoralization of convict labor entailed by the Yates bill, which it was proposed to re-enact with some ameliorating features, but which really afforded no adequate relief. The Fassett bill provides for three grades of prisoners. The last grade is to be composed of incompetents and incorrigibles. An amendment was carried, 69 to 41, preventing the employment of third-grade men on machines of any kind, the object being to make scavengers and general utility men of those who will not work. The question of abolishing machinery altogether was decided in the negative by a vote of 66 to 43, thus permitting the restoration of machinery, with which the prisons have been equipped at a considerable cost. To some extent, however, the bill is emasculated and rendered nugatory by the adoption of an amendment offered by the opponents of the Fassett bill as a sort of compromise, as follows: "The total number of prisoners employed at any one time in manufacturing one kind of goods which are manufactured elsewhere in the State shall not exceed 100 in number in all of the State's prisons, penitentiaries and penal institutions in the State, and shall not exceed 10 per centum of the number of all persons within the State employed in manufacturing the same kind of goods, as shown by the last United States census or state enumeration, except in industries in which there are employed not to exceed fifty free laborers." As finally passed in the Assembly last Monday, the bill appropriation was cut down to \$500,000. In this shape there were but 20 negative votes.

Hardware.

We continue below the careful review of business throughout the country, as per detailed advices received from representative wholesale and retail merchants in the different States:

District of Columbia.

Our advices are to the effect that business in general is good, and the outlook is certainly as good as last year's, and probably better. Competition has kept prices down to a very low margin of profit, and in this respect matters are not improving. The distrust on the part of the trade as to stability of prices has not, however, prevented them from purchasing a sufficient quantity of goods to keep their stocks well assorted, and they appear to be a little larger than usual. Building promises to be active. Collections are a little slow, but there is probably little ground for complaint.

Delaware.

Trade during the season has been uneventful and not altogether satisfactory as to volume, and at present Hardware is dull. The low prices of produce have a depressing effect. Collections are sluggish.

Virginia.

General business shows an improvement over last year, and in many points is reported as quite active, though in some complaint is made of dullness. The Hardware trade was rather late in opening this spring, but business in the main has been satisfactory, and the trade are still fairly busy filling orders. Full stocks are in many cases carried, but the margins at which goods are sold are referred to as close. A cheerful tone characterizes the reports from this State, and the prospects are generally referred to as bright, there being a good deal of building in anticipation, a number of towns showing evidences of enterprise and progress. The short crops for the past few years and low prices for agricultural products the past year have operated against business, but the outlook now for the present season seems favorable and farmers report their growing crops as promising. Collections are good, and merchants are rather more conservative than usual in crediting goods to their country customers, and a larger proportion than usual of cash sales are made. There is not likely to be much improvement in this regard or in the volume of business until the crops are marketed. The development of manufacturing and the erection of factories in a number of places indicate well for future business.

West Virginia.

During the past few weeks business in general has been very fair, but before that was rather slow, owing largely to the condition of the roads, and trade was usually disappointing. Hardware has sympathized with these general conditions and dragged during January and February, but has been quite active since March 1, and careful estimates point to the conclusion that sales for the first quarter of this year will just about equal those for the same time in 1888. It is to be noted that stocks are generally light, as buyers have not been anticipating their wants as freely as usual, and there has been a great deal of pick-up buying. The impression that prices are low and uncertain has tended to induce this, there being little confidence that the bottom has yet been reached. The reports in regard to the amount of building under way or contemplated vary according to the locality, but their general tenor is that there will be more activity in this direction than for some time, and cheap houses especially are likely to preponderate. The

agricultural conditions are good, crops for the last year or two having been fair and those for the present year looking well. Collections throughout the country regions are slow and hard, but in towns usually easy and prompt. There is increased railroad-building and development of the interior of the State, which is affecting business favorably.

North Carolina.

Reports in regard to general business indicate that it is fair and that in Hardware a satisfactory condition of things exists, the demand having been good for the past few months. Trade will probably be light until the early fall, when it is expected that a large business will be done. Stocks of Hardware are full too large, but have been diminished somewhat since January 1. Reports from a number of places indicate considerable building at present and in prospect. Collections are very fair. Prices are referred to as low and demoralized.

South Carolina.

The volume of general business has been good and, in general, up to reasonable expectations. There was, however, something of a general falling off in March, but April witnessed an increased activity. Merchants are usually well stocked with goods, and our advices indicate that they average somewhat more than usual. Our correspondents allude to the unsteadiness and weakness in prices and the narrow profits at which goods are sold. A demand for a better class of goods is, however, referred to. During the season there will be a good deal of activity in building, of which there will be more than for several years past, so that if the crops turn out well, which is at present expected, though, of course, there is the usual uncertainty on this point, it is expected that there will be a fine trade in the fall. Collections of accounts made last year are referred to as having been satisfactory, and there are indications that the ability and will to pay are improving generally. It would appear that manufacturers have had better business through the State than jobbers. Some few salesmen complain of the meagerness of orders. The increased number of new enterprises improves trade and arrests in some degree the outgo of money for manufactured goods.

Alabama.

Advices from this State are cheerful and indicate a good condition of things. Business generally has been satisfactory, with but little reason for complaint, and where this is the case it is owing to special causes which do not represent conditions generally. Stocks of Hardware are well kept up and ample for requirements. The continued development of the State and its industries stimulates business. A good deal of building is indicated and, with good prospects for crops, a hopeful feeling prevails in regard to the fall trade. In agricultural sections farmers have had fine weather for their work, and they have been making good use of it. But little fault is found with collections, and money is referred to as easier now than for some time past. The development of Northern Alabama is progressing satisfactorily, and reports from this part of the State are especially hopeful. The following careful reviews of the situation from Birmingham and Mobile will be of interest:

BIRMINGHAM.—Making the comparison from January 1, 1888, to April 1, 1888, with the period of January 1 to April 1, 1889, our business is 25 per cent. ahead of last year. Collections are fair and the prospects for trade good. We account for the growth in trade over last year from the fact that our city is fast taking its place as one of the leading points for the distribution of goods, and we are constantly gaining new customers from territory that formerly we did not reach. Stocks of Hardware are large and well assorted. Bar Iron is selling lower here than at Southern competitive points, and as this is as in some sense taken as a test of

the market by purchasers, it has helped us to build up a trade that under other circumstances would have required more time. We see no immediate prospect for an advance in Bar Iron, nor do we see anything threatening ahead. Prospects for building good. We anticipate more building this year than at any period in the history of our city. It is too early to say much as to agriculture in this part of the South, since small grain does not amount to much here and the corn and cotton crops are just planted. The farmers are disposed to practice economy and exercise their usual diligence, and we may hope, with favorable weather, for good prospects. Most of the farmers are men of limited means and many of them are in debt—not more so than formerly, however, and the prospect may be said to be good. Our merchants have formed an association with a view to watching freight rates closely and other bearings that the railroads may have in affecting trade at this point in the way of running trains in and out of the city, &c.

MOBILE.—General business has been, and still continues, good for this season of the year, and from general reports has been equal to the past few years, if not better. Hardware business is also satisfactory, especially in Mill and Agricultural Supplies. Stocks of Hardware are fully equal to present demands. June 1 being the end of financial year they are naturally lighter than during the regular seasons. The disposition is to obtain a fair margin of profit, but this depends upon the desire of competing points to cut, which we regret to say is very frequently done. The prospects are that trade for the next few months will be very quiet, and naturally so as being between seasons. The prospects for building are very flattering. More improvements than usual are in hand, and it is expected an unusual activity will prevail during the coming summer months. Agricultural prospects are bright, and this has tended to uphold business in this section. It may safely be said that the best start has been made for five years. Collections have been satisfactory in measure, but it will be necessary to grant some extensions until fall, the same being well secured. Our salesmen representing us in the States of Florida, Mississippi, Georgia and Alabama report encouraging prospects for the coming season, and taking a general view of the situation, with no disastrous crops, we anticipate a large and healthful trade for the next year.

Florida.

Trade has been rather quiet the last few months, and now that the dull season is commencing is falling off. The volume of business does not come up to former years, the effect of the yellow fever which prevailed last year being more or less seriously felt. Collections are only fair and are generally reported hard to make. If all goes well the present summer it is expected that there will be an excellent trade in the fall. The reports from other merchants are confirmed by the following from a well-known house in JACKSONVILLE:

Trade is slackening up in all lines, and will be very dull during the next three months. The volume of business done does not come up to last year on account of the yellow fever last summer. Hardware merchants are running down their stocks, getting ready to take inventory in July. Prices in the main have been good, though there has been some cutting on staple goods. There is not much building going on and the outlook is not encouraging in that line. A few brick blocks and some small frame houses are, however, being put up. The early vegetable crops throughout the State have commenced to move. The crop is large and good prices are realized. Collections have been very fair since the epidemic last summer and are better than we anticipated. Our salesmen have had a good trade during the past three months. They report business slackening up throughout the State and that farmers have good prospects for good crops.

Tennessee.

Both wholesale and retail trade appear to be in good shape, and it is a significant fact that the travelers from whom advices have been received refer to their business as having been more satisfactory than in many other States. Stocks of goods are well assorted and of about the usual size, perhaps on the whole a little larger than last year. The volume of business during the past season was satisfactory and but little fault is found with collections. The agricultural outlook is good and our advices generally are of an encouraging tenor; but, as reflecting the condition of things

through the State, we give below abstracts of reports received from some of the principal points. From CHATTANOOGA our advices are as follows:

Trade in general is fairly good and our Hardware business has been good since January 1, but is now quiet. In this section we have had exceptionally fine weather, which has induced country merchants to buy early. Stocks are fairly full, but not unusually large, and prices are low and irregular. Heavy goods appear to be weakening. The prospect for trade during the next few months appears to be tolerably good, and the outlook for building in Chattanooga and some of the neighboring towns is pretty fair. Crop prospects are also promising. Farmers and merchants appear to be in fairly good condition, as a general thing, and collections are thus far satisfactory. This section appears to be attracting the attention of Northern and Eastern capital, which will do much to develop our large mineral and agricultural interests.

From a well-known house in NASHVILLE we have the following report:

Business has been excellent since January 1, and our sales largely exceed those of 1887 or 1888, and payments are equally satisfactory. This State, especially the western part, is in excellent financial condition. Many new merchants have entered the field, and all seem to think the present year will have a very fine business. Hardware stocks are light. Prices have been low, but sales have more than made up the difference. We expect trade to be quiet until July 1, but are having, however, a nice demand for goods. Our country is growing, and every one has faith in its future. This is the country for young men, and small capital judiciously managed can be made to yield good profits. Salesmen report that their sales have been heavy this year. There have been but few failures.

From KNOXVILLE a prominent concern writes:

Business in general is very good and Hardware better than we have ever known it, because of the amount of building in prospect and process, the opening of new mines and the building of new railroads. Stocks of Hardware are about as usual. There is little complaint in regard to the cutting of prices. Agricultural prospects are unusually good, but collections are slow at present. They have, however, been good until within a few weeks. Traveling salesmen appear to be well pleased with the business they are doing, considering it is rather between seasons.

Minnesota.

General business during the year thus far has been a little slow and less in volume than usual, though from a few points, owing to special local circumstances, a much more active market is reported. This depression in trade, if it may be characterized by this term, is induced in good measure by the fact that the crops for the past two seasons were unsatisfactory, having been partial failures, so that, as a rule, the farmers have but little money. The decline in the price of wheat and the continued depression in the price of cattle also tend in the same direction. In this condition of things there has been only an average business in Hardware. Our correspondents, however, advise us that at the time of writing prospect for crops was good and the outlook for trade very satisfactory, though it will naturally be quiet until after harvest. In the cities there is a fair amount of building, but throughout the country generally comparatively little. Stocks of Hardware are below the average, the condition of the market at large and features of business in the State not having induced as liberal purchases as usual. With a good crop there is every indication of an excellent business in the fall, and the meager stocks in the hands of the trade would need extensive replenishing. The situation is thus summarized by a prominent jobbing house:

Business in general has been a little slower than usual at this season, but the spring trade has been quite satisfactory. Stocks of Hardware are about a fair average, and the outlook for trade during the next few months is good. More building is in progress or projected in the city of St. Paul than was ever before known. Everything looks favorable now for a good crop, but it is too early to prognosticate with any certainty. Collections are slow.

Other points are given in the following from another well-known house:

Farmers have very little to sell, crops having been partial failures for the last three years. The spring has been dry, thus retarding lumbering operations. Hardware is no exception to trade in general and is dull. Stocks of Hardware are light and there is little disposition to buy. Prices have been thus far much depressed, salesmen being inclined to cut. We do not look for much improvement until the crop prospects become apparent and are favorable. We hear but little about building and consider the prospects poor. It is too early in the season to say much about agricultural conditions. Considerable winter wheat was sown, but we think the weather has been unfavorable. Collections can be said to be fairly good.

Missouri.

Trade both in general business and Hardware has been very satisfactory thus far this year, nearly all our reports thus characterizing the condition. January and February business was in excess of the same months last year, but in March there was a falling off as compared with March, 1888, but April has been a decided improvement. A number of merchants refer to the year's business as in advance of preceding year by considerable percentages, while from some points business is referred to as about average, but with evidences of improvement in some respects. The prospect for future business is regarded as excellent, though this is, of course, largely dependent upon crops, which are, however, referred to as promising well, the indications pointing to an exceptionally large yield. Several of our correspondents allude to the prospects for winter wheat, corn, fruit, &c., as never having been better, and this condition of things following the good harvest of last year induces a hopeful feeling. As the winter was an open one opportunity was given for a good deal of building, and there is a fair amount now going on, with more in contemplation. In some places, however, there is not much activity in this direction. Stocks of Hardware in hands of retail merchants are rather small but well assorted, and a good deal of conservatism is observed in buying, their orders covering only their actual wants. Collections are fair to good and are evidently easier than in many other parts of the country. Taken all in all, trade in Missouri is in a healthful condition and anticipations are generally entertained of an excellent fall demand. Business in St. Joseph is in excellent condition, and the prospects for this center are regarded as very promising. The following report covers the features of business in KANSAS CITY:

There has been no decided increase in the volume of business thus far in '89 over '88, but a slight general improvement has been noted. Stocks in the hands of retail merchants are small and lighter than for several years. Prospects are for a better trade during the summer months, and jobbers anticipate a large fall business. Building is going on steadily. The growing crops are in excellent condition and indications are for the largest crop we have ever had. Collections are fair and traveling salesmen report prospects as good.

This review of the business in the State may appropriately be supplemented by the following careful report from a leading St. Louis house:

In regard to the general business condition of this locality we do not consider the situation very flattering, and have heard many complaints from many lines of business in regard both to the volume of trade and the prices. The Hardware trade seems to have been better than the majority of the other lines, and we cannot with justice find much fault with the volume of our spring business. Hardware stocks are generally small throughout the country, and it occurs to us that the average country merchant does not carry, as a rule, as heavy a stock of merchandise as he formerly did. The tone of the market as regards prices is very discouraging, but as it has been getting worse from year to year for a long time we have almost ceased to grumble. We cannot see that there is anything very promising in sight for the near future. The heaviest demand for

building material is over, the mild winter enabling carpenters to begin work much earlier than usual. The condition of the crops in this vicinity is good and ought to enable the farmer to save some money. Collections are only fair, and it requires constant reminders to bring them to time. It is well that we do not have to rely on one section of the country only. The conditions are very different in different localities. Some territories are good and promising more, others the reverse. There is nothing that we know of that will cause any great increase in the volume of trade, but the country tributary to this city is being settled more rapidly and commanding more attention than ever before and we look to that to create a healthy demand for goods.

Arkansas.

Reports from Arkansas are satisfactory and indicate a healthful condition of things. There is no general complaint of dull trade, the volume of which is up to reasonable expectations. The future course of business depends mainly on the crops, of which it is too early to form as yet a reliable estimate. The following report refers to the situation more in detail:

Business in general is in a healthy and thriving condition, with few complaints of dull trade. A splendid spring business has been done in Hardware, but the demand is now slackening up. Stocks are fair but not large, and are pretty well reduced by spring trade. A good deal of cutting in prices is going on, but taken as a whole they are fair. Trade will necessarily be quiet for the next few months, as is always the case in the Southern country. The prospects for building are good. New buildings are going up all over our State. Agricultural conditions as affecting trade are good, and collections to this time have been fair, but we may expect them to begin to be slow from this on until the new crop comes in, especially in the rural districts. Farmers are all busy putting in their crops, and we cannot tell much about the prospect of the year.

Kansas.

Trade in general is rather dull, and the volume of business thus far is not up to expectations. A similar remark may be made in regard to Hardware, which, like other lines, is quiet, with no prospect of improvement until after harvest. The purchases of the trade during the past few months have been for the most part limited to small quantities and for goods needed, without attempting to anticipate future wants. The reports given by travelers are not especially good, and they state that with their best efforts it is difficult to keep the volume of sales up to the average. The course of future trade depends almost entirely upon the result of the harvest, and it is generally agreed that if the crop is good there will be an exceptionally satisfactory business in the fall, and it is gratifying to note that the reports indicate almost universally that at the present time the outlook is especially good, crops of all kinds being in fine condition. The opening of Oklahoma has stimulated trade along the border, and, it is hoped, will give an increased business in the future. Farmers have but little money, and collections are slow and difficult. The general conditions, while trade is not as active as might be desired, are, however, regarded as healthful, and as affording a basis for a good business in the future, and, as stocks of Hardware are generally rather below the average, it is expected that when business revives a very satisfactory trade will be done, which will call for a prompt and general replenishing of stocks. We give below an abstract of two reports, the first from a representative retail merchant, and the second from a well-known wholesale jobbing house:

I do not hear of any line of business that reports good trade. Those who have had a fair volume complain of small margins. Hardware for a large section of country is very unsatisfactory as to amount and profits. Stocks generally are small. Buying is for sorting more than for stock. While prices are not demoralized, desirable customers undoubtedly are able to get goods under the general market. The crop prospects are better than any spring for a number of years, but money is not in the country to trade with. A good deal of caution is exercised in regard to

credits. The extent of building will depend on the coming season's crops. The failure of a large part of the crops for the last two years has been more injurious than merely the loss of the crops, as immigration has been greatly checked. All things considered collections are fair. Traveling salesmen are comparatively scarce and few report any increased sales. The drummers who used to call in 30 to 60 days one or two years ago have not been here in months. The future trade depends entirely on coming crops, which have a good showing now, so that there is good reason to expect a good fall business.

Business is light in all lines, as well as in Hardware. Stocks are good, and may be regarded as large for the conditions of trade. Prices are low and steady and margins small. The probability is that spring and summer trade will be light. The outlook for crops would indicate a good or at least an increased fall trade. The prospects for building are only moderate. Crops were a partial failure last year, but the outlook this year so far is magnificent. Collections are pretty slow, but as good as could be expected. Traveling salesmen are hopeful for the future. The prospects for trade in Kansas and Nebraska are all right if we get a crop, otherwise not.

Nebraska.

Business in this State has been steady, and of volume equal to former years with generally very satisfactory conditions. Prices as a rule are holding their own, but there are no evidences of overstocking or demoralization of prices locally. There seems to be a disposition on the part of consumers to purchase carefully and the trade also have been conservative in not ordering beyond their requirements. About the only unfavorable condition to be noted is the low prices ruling for cattle and farm products generally, but last year crops were excellent and the prospects for this year's crops are uniformly reported good, the ground being in excellent condition, so that the outlook in this regard is considered especially favorable. A large proportion of last year's crop is still in the hands of the farmers, who are holding it on account of the low prices ruling. An influx of immigrants is reported throughout the State. There will evidently be a large amount of building, especially in the cities and large towns. Collections are fairly good, and consumers are reported as owing less to dealers than for some years past, though from some quarters collections are referred to as below average. The general impression received is, however, that they are reasonably good. In this condition of things a satisfactory business is expected during the summer, and especially an improved demand in building Hardware and Tools.

Dakota.

In sympathy with the condition of general business, Hardware is dull, there being a disposition to wait until the crops for this season are harvested. Sales during the season have been below the average and trade has been in most instances sluggish, with reports of fair activity in some points where local conditions are favorable. The outlook for the crops is promising, but it is too early to predict with confidence; the general impression prevails that if they are good there will be an exceptionally active trade in the fall. Collections have been on the whole rather poor, but some of our correspondents state that in the fall of 1888 and last winter collections were exceptionally good, and many debts were paid and mortgages canceled. Prices are without special features, but have been to a good extent cut by merchants in order to induce sales. We receive advices from a number of points that business generally has been considerably demoralized by the territorial and local farmers' alliances, who endeavor to do business without the aid of merchants. The following additional advices in regard to trade in the Black Hills will be of interest:

General business has been better than in 1888 or 1887, and is in much more satisfactory condition as regards credit than ever before.

There have been more cash sales and shorter credits given. Hardware has been as good, if not much better, than other lines of trade. Stocks of Hardware are unusually small, owing to a good spring trade and the more conservative manner of buying goods, dealers having found that it does not pay to overstock. The prospect for trade during the next few months is good, and in this section there will be more building than any year since 1878 except 1886. Last year there were big crops and there is every indication of good crops this year. Farmers are gradually improving their financial condition. Collections are fair, being better than 1887 or 1888 and not as good as 1886. The prospects for mining developments are good, quarries are being opened up and some manufacturing industries started.

The Cut-Nail Extras.

The fact has occasionally been alluded to in our Western market reports that the practice is growing of making a low base price on Cut Nails, which is graduated according to the quantity of small Nails included in an order. Quite a number of Nail manufacturers had been in the habit of doing something similar whenever they found prices getting down to an unremunerative point. They insisted on their customers making up assorted orders to average a certain advance over the base, to get the benefit of the lowest price current. For instance, if the price of Nails fell to \$1.65 at the factory, they continued to sell, but they carefully watched specifications and made an average of 25 cents or 30 cents above base an essential requisite for the acceptance of the order. The new arrangement, however, is based on a scheme which is not so productive to the manufacturers. The old way erected a structure of possible profit on a foundation of unremunerative business. The new way cuts into the foundation still deeper and diminishes profits merely for the sake of making sales.

This new departure is perhaps merely an outgrowth of the times, and the depression of the Nail trade is more to blame for it than the manufacturers who are charged with its parentage. The Bar-Iron manufacturers passed through a similar experience just about a year since, when their card of extras was cut in two by the formal announcement of a prominent firm, who merely did openly and above-board what their competitors were doing, and had been doing quietly, but almost universally. The Bar-Iron extras were attacked by the manufacturers themselves, because in comparison with the base price for Iron they were undoubtedly high, and presented a tempting opportunity to be used for bait to catch an order. The progress of the times had outgrown the old card of extras, and no single concern was really responsible for the revision which was thus forced. The changes of the future will probably tend to the further reduction of such extras rather than their restoration to the old figures. The Cut Nail extras are susceptible to the same influences, and are being affected by the same cause. A level of prices will be struck which will appear to establish a more natural relation between low base rates and extras for small sizes, and there the movement downward will halt for a time, as in the case of Bar-Iron, unless the power of the combined Western manufacturers can restore the old conditions, which does not now seem probable.

This new method of selling Nails has injected into the trade some very annoying features to jobbers and retail merchants. All are, of course, anxious to get the lowest base prices, and they consequently order assortments, including the necessary quantity of small Nails, to cover the requisite average above the base. The jobbers are enabled to do this with somewhat of ease, as they handle large stocks of every size. Retail merchants, however, load themselves up with small Nails enough to last for some time, but soon run out of large Nails, and are then in the

market for base sizes. They apply to jobbers for small lots of such sizes, and find that their trade is regarded as undesirable, because the jobbers are obliged to take care of their regular customers who are purchasing assortments. Jobbers are now instructing their salesmen to be very careful in making sales of Nails for this reason.

The manufacturers are discussing this new phase of the Nail situation with much interest, as they see in it the threatened destruction of their only opportunity to get a profit from the sale of Nails. The reduced cost to dealers of the smaller sizes of Nails may restore to the Cut-Nail trade a large part of the business which has been wrested from it by the Tack and Wire-Nail makers, but that would be a barren victory if it were accomplished by the total sacrifice of profits. It is by no means regarded as a compensation for the loss to be sustained. Some of the manufacturers suggest the adoption of a certain price for each size of Cut Nail, so that a dealer can buy what he chooses and just as large a quantity of each size as he desires, without reference to any other sizes in his order. Predictions are being made now that the Cut-Nail trade will adjust itself on a basis of this kind or something approaching it within the next six months.

Miscellaneous Prices.

The following is the new association price list of inside Iron Strapped Blocks, which was adopted by the manufacturers, to go into effect after May 1. The discount applying to the rest of the list applies to this new list also:

Inside Iron Strapped Blocks.

Size.	Mortise.	Iron bushed.			Roller bushed.		
		Single.	Double.	Triple.	Single.	Double.	Triple.
3	9-16	\$0.70	\$1.30	\$1.75	\$1.10	\$2.00	\$2.90
3½	9-16	.75	1.45	2.00	1.15	2.20	3.15
4	11-16	.85	1.60	2.15	1.20	2.25	3.25
5	¾	.90	1.75	2.25	1.25	2.35	3.50
6	1	1.10	2.00	2.90	1.50	2.85	4.40
7	1¼	1.30	2.40	3.50	1.70	3.35	5.00
8	1½	1.65	2.85	4.25	2.25	4.15	6.00
9	1¾	1.85	3.40	4.75	2.50	4.70	7.25
10	2	2.75	4.50	6.25	3.50	6.00	8.50
11	2½	Same list as 12 inch.			Same list as 12 inch.		
12	3	4.45	7.50	10.65	5.30	9.20	13.30
13	3½	Same list as 14 inch.			Same list as 14 inch.		
14	4	7.00	10.50	15.00	8.15	12.80	18.45
15	4½	8.00	13.00	18.00	9.25	15.50	21.75
16	5	10.00	15.00	22.00	11.50	18.00	26.50

Walter Coleman & Son, Providence, R. I., have issued the following new and reduced list of Iron Sheaves for Tackle Blocks. As the dimensions of the Sheaves are well known they are referred to by numbers, the number being the size of the Block that the Sheave fits. The Common Sheaves are subject to a discount of 30 per cent., and the Patent Sheaves to a discount of 45 per cent.:

Number.....	3	3½	4	4½	5	6
Common; new						
price.....	\$0.05	.05	.06	.08	.10	.12
Patent; new						
price.....	\$0.34	.37	.40	.44	.46	.53
Number.....	7	8	9	10	11	12
Common; new						
price.....	\$0.15	.21	.24	.36	.40	.56
Patent; new						
price.....	\$0.62	.76	.81	1.08	1.15	1.40
Number.....	13	14	15	16		
Common; new						
price.....	\$0.68	.90	1.06	1.25		
Patent; new						
price.....	\$1.75	1.95	2.35	3.00		

Items.

John Wilson, the well-known manufacturer of Butchers', Skinning and Sticking Knives and Butchers' Steels, Shoe Knives, &c., Sheffield, England, has appointed Hermann Boker & Co., 101 and 103 Duane street, New York, his sole agents

for the sale of these goods in the United States, and he requests that orders either for importation or from stock be addressed to them. Hermann Boker & Co., referring to this announcement, state that they have accepted this sole agency and will carry a full stock of the goods on hand, while orders for importation will be filled as promptly as possible. This arrangement by which the efficient marketing of this leading line of goods will be secured, and the convenience of the purchasers thus served, will be appreciated by the trade. Formal announcements are made of this agency on page 70.

The Medford Fancy Goods Company, 44 and 46 Duane street, New York, who are, we believe, the only exclusive manufacturers of Dog Collars and Furnishings in the world, in their advertisement on page 80 call attention to the inducement they offer to the trade of first orders and refer also to the extent of their stock and the quality of their goods.

S. A. Munger & Co., Detroit, Mich., issue a price current showing the Otsego Farming and Garden Tools, Shovels, Spades, Wire Cloth, Screen Doors and Windows, Lawn Mowers, Refrigerators, Freezers and other seasonable goods.

The trade will learn with regret of the death, on the 20th ult., of Geo. R. Kelsey, president of the American Buckle and Cartridge Company, West Haven, Conn.

Hartman Mfg. Company, Beaver Falls, Pa., issue a neat pamphlet describing the Steel Picket Fence and Gates of their manufacture. Full description is given of this Fencing as constructed of heavy Steel Wire which cannot be broken, and is firmly held by steel posts driven deep into the ground and anchored there so that they cannot be uprooted. Other advantages possessed by this Fencing are pointed out, its beauty, durability, convenience and economy being emphasized. Different patterns of Gate, Corner and Line Posts are shown and a number of testimonials given. The Flexible Steel Wire Mat is also represented.

In these times when increased attention is given to elegant printing for trade purposes, the advertisement on page 53 of John A. Lowell & Co., Boston, Mass., will be of special interest. It calls attention to their engraving and printing, which, as well known, is artistic and of a high order. They also emphasize the fact that they are in a position to furnish original ideas by means of which their work may be made especially attractive and serviceable to their patrons.

The Ambler Saw Mfg. Company, Natick, Mass., issue a circular relating to their Band Saws and Band Saw Tools and Machinery. Their Band Saw Filing Machine is especially referred to and a list of representative houses using it given.

In their advertisement on page 68 the Holmes & Edwards Silver Company, Bridgeport, Conn., call attention to their Durham Silver Metal Spoons, Forks, &c., a line, it will be understood, of solid metal goods unplated. This is, we believe, the original brand of this class of goods, and the company allude to the success which has attended its sale, and the uniformity of the quality and finish.

It will be seen that in their advertisement on page 81 C. F. Guyon & Co., 99 Reade street, New York, call attention to their extensive line of agencies, and illustrate the Pin Tumbler Rim Latch made by the Brooklyn Lock Company, for whom they are representatives.

John R. Scott has opened a retail Hardware store at 112 Randolph street, Chicago. He will carry a general line, but will pay special attention to Builders'

Hardware, Cutlery and Tools. Mr. Scott was connected with Kellogg, Johnson & Bliss for 12 years, having been a partner for the last three or four years of the connection, and during the past year he was one of the managers of the Chicago branch of P. & F. Corbin. He is thus well equipped to handle the trade of contractors and builders.

William Willer, of Milwaukee, Wis., has issued a price list for the spring of 1889 covering the Willer Sliding Window Screens and custom-made Screen Doors manufactured by him for fine residences and other buildings. His Sliding Screens are balanced by springs and can be moved to any part of the window, remaining wherever placed. They are made in a variety of styles and of all sizes. The circular shows a large number of designs of Screen Doors, from plain patterns to very ornate frames, each design being numbered for facility in ordering. They will be furnished in all the usual kinds of wood, covered with black wire cloth, or will be covered with other cloth if specially ordered.

The American Folding Chair Company, St. Louis, Mo., issue a collection of illustrations made by photographic process of their Settees and Chairs for lawn use. They allude to their line for this year as superior to any they have yet manufactured.

Among the business opportunities announced on page 59 those looking for such an opening will observe an advertisement relating to the sale of a Hardware house with an established business, in West Massachusetts. The stock carried is mentioned as about \$30,000, and the desirability of the opportunity is alluded to.

Dame, Stoddard & Kendall, Boston, Mass., in their advertisement on page 78 make, it will be observed, a seasonable announcement in regard to Fishing Tackle, and illustrate Skinner's Fluted Trolling Spoon Bait, and call attention to leading lines of Fishing Tackle, &c., for which they are agents.

The trade will observe the advertisement of Henry Diston & Sons, Philadelphia, Pa., occupying page 73, in which they illustrate some of their leading Cross-cut Saws, and call attention to their special features, the method of manufacture, &c.

We are advised by the Toledo Block Works, Toledo, Ohio, that they have appointed J. C. McCarty & Co., 97 Chambers street, New York, their agents for the sale of their Tackle Blocks, who will carry a stock for the convenience of the trade and will be prepared at all times to name the manufacturers' list prices.

An announcement of some unusual interest is made on pages 84 and 85, in which Morley Bros., East Saginaw, Mich., call attention to their new catalogue of about 1000 pages, and state that they will send it with a shipment of \$100 worth of shelf goods or goods of their own manufacture. The arrangement of this catalogue, covering Hardware, Tin-Ware, Wagon Stock, Mill Supplies and other lines, makes it especially desirable, and the trade will appreciate the opportunity of having such a book. An interesting illustration is also given of their different stores, warehouse, factory, &c.

Arrangement of Stores.

Our attention has been called to a number of excellent devices for arranging stock which have originated with J. F. Wollensak, 227 Lake street, Chicago. Prominent among them is a case for holding retail stocks of Screws, Rivets, Escutcheon Pins, Trunk Nails, Machine Screws, Copper Washers, and all small articles of that kind which require a great deal of room when they are kept in com-

plete variety. This case is illustrated below, Fig. 338. The case is constructed in sections, each section containing two large drawers or slides, as shown in the cut. The top is used as a desk or counter. The slides are mounted on rollers such as are used for theatrical scenery, so that they can be moved in and out easily. Each

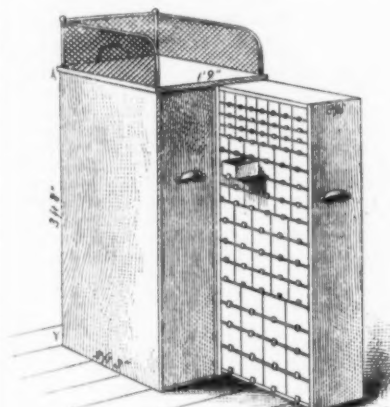


Fig. 338.—Screw and Rivet Case.

slide is fitted with shelves to suit the proposed contents. Screws are kept in the sample-case shown. The shelves are made of $\frac{3}{4}$ -inch pine and have no upright partitions, the small drawers fitting up closely against one another. These drawers have leather pulls attached to them instead of Screw Eyes, as the latter, being rigid,

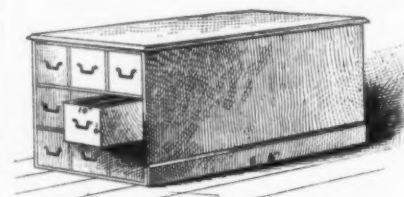


Fig. 339.—Case for Tubing.

might be bent or knocked off in pushing the slide in or pulling it out. The shelves are placed $1\frac{1}{4}$ inches apart on the top four rows of small drawers, $1\frac{1}{4}$ inches apart on the next four, $2\frac{1}{4}$ inches on next four and $2\frac{1}{4}$ inches apart on the lowest four. The number of drawers ranges from nine on the top shelf to five on the lowest. The drawers are made of thin wood, with

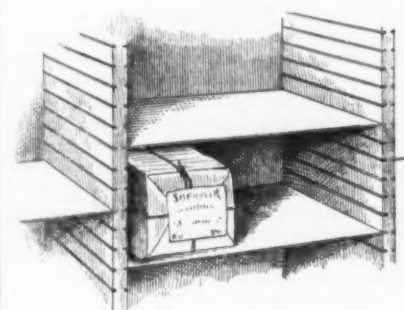


Fig. 340.—Method of Arranging Adjustable Shelving.

a slight taper toward the back, so that they will slide in easily, but they could be made of paper. Each drawer is, of course, properly labeled and each is calculated to hold a paper of Screws, with a little margin in addition. It will be seen that the goods are doubly protected from dampness and dust. Flexible Tubing, or Gas Hose, has been found

somewhat difficult to keep properly, because of its length and its liability to "set" if coiled for any length of time. The plan adopted by Mr. Wollensak overcomes all objections. He has had a case of drawers made, as illustrated above, Fig. 339. The case is 6 feet 6 inches long, 36 inches wide and 33 inches high, and the drawers are nine in number, each 9 inches high by 10 inches wide, and they slide in at the end of the case, so as to extend its whole length. They thus accommodate the Tubing laid perfectly straight in the usual 6-foot lengths. The Tubing being flexible, yet stiff enough to push into the drawers easily, it is not necessary to have room enough in front of the drawers to pull them out far when taking out goods or storing them away. The top of the case is used as a counter.

The space on the floor under shelving is usually wasted, as it is an undesirable place to store goods, on account of the dust and dirt. Mr. Wollensak utilizes this space for boxes made to fit up close to the shelf above and mounted on heavy double-roller casters. In these boxes heavy goods are carried. They are easily rolled out on the floor when access to their contents is desired, and they can be wheeled to other parts of the store to be filled or emptied. One upright is used to every two boxes in this store, instead of partitions at the side of each one. A system of shelving, Fig. 340, adapted for broken or mixed stocks, is very ingenious, and would be desirable in quite a number of cases in which fixed shelving is used. The uprights are made of $\frac{1}{2}$ -inch boards, with a series of shallow cuts made across them by a rip-saw, these cuts extending from the bottom to the top of the uprights, just $1\frac{1}{4}$ inches apart. The uprights are placed $1\frac{1}{2}$ feet apart, and between them the shelves extend, which are made of No. 14 sheet iron, cut to fit nicely and japanned, so as not to rust. These shelves can be moved by means of the cuts in the uprights so as to leave any desired space between them. Small packages can thus be placed separately on the shelves instead of being piled up, as would be necessary with fixed shelving. No space is wasted, as the shelves are so easily shifted to suit the size of any kind of a package.

Exports.

PER BARK REBECCA CROWELL, APRIL 11, 1889,
FOR BRISBANE, QUEENSLAND.

By H. W. Peabody & Co.—11 packages Hardware, 20 cases Fire-Arms, 11,238 pounds Barb Wire, 53 packages Hardware, 13 crates Stoves, 12 dozen Handles, 10 packages Lampware, 1 case Wringers, 22,474 pounds Barb Wire, 3 packages Road Machinery, 1 case Steel.

By A. S. Lascelles & Co.—44 dozen Axes, 6 dozen Picks, 17 cases Handles, 3 cases Hardware, 20 dozen Hatchets, 16 dozen Hammers, 6 cases Scales, 1 crate Trucks, 1 box Wheels, 100 boxes Clothes Pins, 10 dozen Wash-Boards, $\frac{3}{4}$ gross Grease, 8 cases Tacks, 280 pounds Nails, 13 dozen Wrenches.

By F. B. Wheeler & Co.—1 case Buggies and 1 pair Shafts, 300 dozen Handles, 120 dozen Handles, 86 dozen Handles, 5 cases Buggies, 5 pairs Shafts, 2 cases Buggies, 2 pairs Shafts, 5 cases Axes, 2 cases Tumblers, 13 gross Cow Bells.

By Coombs, Crosby & Eddy.—50 dozen Handles, 1 dozen Wheelbarrows.

By Winchester Repeating Arms Company.—24 Guns, 20,000 Primers, 1020 Metallic Cartridges.

By R. W. Cameron & Co.—10 dozen Handled Axes.

By V. Basanta.—5 dozen Mattocks, 220 dozen Slaters, 10 gross Toy Pistols, 9 dozen Door Springs, 5 cases Tacks, 12 dozen Locks, &c.

By Arkell & Douglas.—30 dozen Edge Tools, 3 Ranges, 5 dozen Edge Tools, 35 cases Edge Tools, 25 dozen Wash-Boards, 24 dozen Wash-Boards, 10 cases Axle Grease, 10 crates Polish, 10 dozen Edge Tools, 10 gross Blacking, 2200 feet Hose, 2 cases Hoes, 2 barrels Blocks, 2 cases Axle Grease, 763 pounds Bolts, 7 packages Hardware, 13 cases Lawn Mowers, 600 feet Hose, 36 crates Refrigerators, 6 crates Stoves, 19 packages Hardware, 48 cases Edge Tools, 6 cases Handles, 5 cases Bolts, 58 cases Handles, 6 crates Shellers, 42 packages Hardware.

Business Changes.

The well-known house of J. C. McCarty & Co., 97 Chambers street, New York, has been reorganized, as per the following announcements:

NEW YORK, May 1, 1889.

Notice is hereby given that the copartnership heretofore existing between the undersigned, under the firm name of J. C. McCarty & Co., expired by limitation on the 30th ult., and that all accounts due the late firm are to be adjusted with and be paid to the new firm of J. C. McCarty & Co., formed this day as stated below.

J. C. McCARTY,
W. H. LITTELL,
T. P. BURKE,
JAMES SURPLESS.

NEW YORK, May 1, 1889.

Referring to the above notice of dissolution, the undersigned beg to inform their friends and the Hardware trade generally that they will continue the business of Hardware manufacturers' agents from this date at the old location under the firm name of J. C. McCarty & Co., and they respectfully solicit a continuance of the confidence and patronage with which they have been honored in their former relations.

J. C. McCARTY,
W. H. LITTELL,
T. P. BURKE.

The business will thus be carried on without change of name and with the same lines of agencies representing many of the leading kinds of Hardware.

Connected with the above change we have this announcement in regard to a new firm under the style of Surplus, Dunn & Alder:

NEW YORK, May 1, 1889.

The undersigned have this day formed a copartnership under the firm name of Surplus, Dunn & Alder, at 97 Chambers and 79 Reade streets, for the transaction of the Hardware commission business. Trusting that our old friends will remember us in our new departure as they have in the past, we are

Yours truly,

JAMES SURPLESS,
ROBERT W. DUNN,
BENJAMIN S. ALDER.

Of these gentlemen Mr. Surplus was a member of the firm of J. C. McCarty & Co., and he and his partners in the new firm have been connected with the Hardware trade for a number of years, so that they are widely and favorably known. They enter upon their commission Hardware business under promising auspices, representing the following well-known manufacturers, whose products include, it will be observed, a varied line of leading goods:

The Gutta-Percha and Rubber Mfg. Co.,
Capitol Mfg. Company,
H. Chapin's Son,
Keystone Lock Works,
Lindsay & McCutcheon,
Cronk Hanger Company,
Chadborn & Coldwell Mfg. Company,
The Western Block Company,
Nes Chain Mfg. Company,
Champion Blower and Forge Company,
John Auer, Jr.

Their announcement giving further particulars in regard to their agencies, & mentioning that they give special attention to the export trade, will be found on page 82. In these new departures both J. C. McCarty & Co. and Surplus, Dunn & Alder will have the best wishes of the trade for their success.

Inaccuracy in Designating Chain.

With reference to the tendency on the part of manufacturers to designate Coil and other Chains inaccurately, as the Chain is made larger than the size for which it is sold, we have the following communication from one of our correspondents, in which the mischief of this practice is alluded to and an earnest appeal made for a return to accuracy in this regard:

We are much interested by the discussion of the nominal and real size of Coil Chain in your issue of April 4. There is

no question but that, starting possibly with the small difference of $\frac{1}{16}$ larger than the marked size, this fraction has grown, as your correspondents themselves acknowledge, through various stages, $\frac{1}{16}$ into $\frac{1}{8}$, so that in many cases the $\frac{3}{16}$ Chain measures $\frac{1}{4}$; $\frac{1}{4}$ measures $\frac{3}{8}$; $\frac{3}{8}$ measures $\frac{1}{2}$, or so slightly scant as to be hardly appreciable by instruments even of accurate measure. That this is wrong is readily acknowledged by the very ones who are parties to the fraud or attempted fraud. It would be just as ridiculous to call No. 4 Iron (whose diameter is, as your correspondent says, 0.238) $\frac{1}{4}$ and attempt to sell it for $\frac{1}{4}$, to be cut by $\frac{3}{16}$ dies and fit $\frac{3}{16}$ Nuts, as to attempt to pass off Chain of that diameter for $\frac{1}{4}$. It would be equally absurd to sell a 9d Nail for an 8d Nail. In short, the practice or deceptive making or marking should not be tolerated by either consumer or handler. This way of cutting price by furnishing wrong sizes meets its parallel in certain other trades. In dry goods, for instance, up to recently a bolt of ribbon marked 12 yards had been gradually reduced in length till the ribbon thereon measured only 10 $\frac{1}{2}$ yards. But this discrepancy became so glaring that the labels themselves are now stamped 10 yards; 10-4 wide goods are barely over 9-4; 24-inch silks run 23; 2-yard table linens are scant from 3 to 4 inches, but the writer is assured by the shoppers in his family that this practice is being steadily discountenanced more and more until the label is beginning to nearly represent the actual measure. Deception must of necessity be short-lived, and it is wholly unworthy of those engaged in the manufacture or dispensing of Hardware to lend themselves to any device so unworthy of goods where really mathematical exactness ought to govern. A 6 $\frac{1}{2}$ -6-2 Trace should mean exactly what it says. Those manufacturers who can make and sell with equal readiness a Chain five links to the foot should sell it for five links and establish a difference in price between the two. A $\frac{1}{16}$ Tire Bolt, too, might well be $\frac{1}{8}$, not $\frac{1}{16}$ scant.

Let every one set his face against what he must condemn in a moment of serious thought, and the complaints which are fully justified under the present conditions will disappear. By French law any article that might be mistaken for something more valuable must be marked "imitation." We hope the day is far distant when any such label could be justified on American Hardware. If "a just weight is a delight" to the Almighty, we take it He looks with equal favor on a Chain properly calipered or gauged.

FRACTION.

The territory of Oklahoma, as defined by the Springer bill, includes Oklahoma proper, "the Cherokee Outlet," and the so-called "No Man's Land," or "Public Land Strip," and is bounded as follows: On the west by Texas and New Mexico, on the north by Colorado and Kansas, on the east by the reservation occupied by the Cherokee tribe of Indians east of the ninety-sixth meridian of west longitude and by the Creek, Seminole and Chickasaw reservations, and on the south by the Creek, Seminole and Chickasaw reservations and by Texas. Its acreage is as follows: Cherokee Outlet, 6,022,244 acres; Public Land Strip, 3,672,640; Oklahoma proper, 1,887,800. That portion of these lands just opened for settlement by proclamation of the President lies very near the center of the Indian Territory.

Contracts for the manufacture of nine iron oil tanks of 40,000 barrels each for the Globe Refining Company, the Standard's rival, have been awarded. The tanks will be located on the Delaware River front, where a large plant is in course of preparation.

Barn-Door Latch.

Johnson & Co., Marysville, Ohio, are inviting the attention of the hardware trade to what they designate as the Steel-Plate

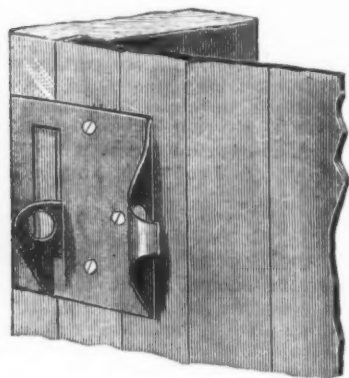


Fig. 1.—Position when Door is Closed.

barn-door latch, for which they claim it is the only barn-door latch that can be opened or locked from either side of the door. Among the other advantages also claimed is that it will allow the door to shrink or sway $\frac{1}{8}$ inch and still perform its function. The round hole shown in Fig. 1 is for the purpose of hanging the lock when not in use, and does not interfere with the handle when opening the door; the latter can also be securely locked on the inside with a nail placed over the catch as shown in Fig. 2 and the outside by means of a padlock inserted through the hole in the catch. It is claimed that when locked from the inside it cannot be opened from the outside by any device, thereby

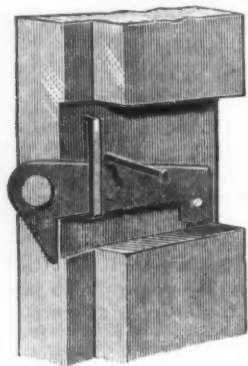


Fig. 2.—Position of Catch on Post.

affording absolute security and protection. The material used is described as the best steel plate procurable, giving great strength and durability.

Wire Sash Lift.

The illustration herewith given represents the Climax wire sash lift, which is put on the market by the Van Wagoner



Wire Sash Lift.

& Williams Company, 82 Beekman street, New York. It has, it will be observed, a single loop, and thus differs from the Gem,

which is made with a double loop. It is especially adapted for window screens and as a pull for screen doors. It is furnished coppered, walnut bronzed, nickel-plated on brass, or in brass.

New Corkscrews.

The accompanying illustrations represent additional patterns of corkscrews which are put on the market by James D.



Fig. 1.—Self-Extracting Corkscrew.

Frery, Meriden, Conn. Fig. 1 represents a self-extracting screw, the cut being half size. It is so constructed that it is to be turned until the flange reaches the cork, when, by continued turning and a slight pull, it is stated, the hardest cork can be extracted. It is made either bronzed or in full nickel-plate. Fig. 2 represents a spiral twist corkscrew with pick or wire

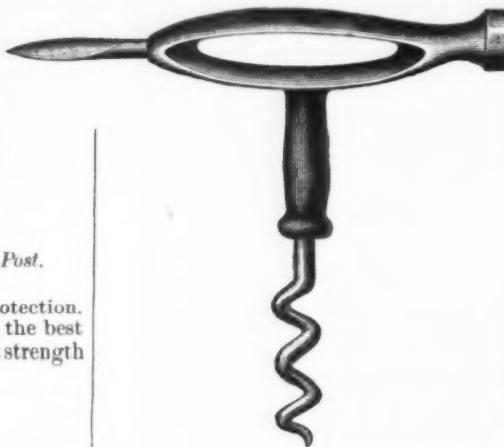


Fig. 2.—Corkscrew with Pick or Wire Stripper.

stripper. This also is made bronzed or full nickel-plate.

Who shall dig the Nicaragua Canal is a question now before the courts. The American Atlantic and Pacific Ship Canal Company, through their attorney, have given notice to the Maritime Canal Company, of Nicaragua, that they will apply to the Supreme Court for a permanent injunction upon this work, contending that the State of Nicaragua granted to Cornelius Vanderbilt and other citizens of the United States the exclusive right of constructing a ship canal across its territory.

The Blackmore Pipe-Hanger.

A new style of pipe-hanger which embodies a number of valuable features is being manufactured and offered to the trade by



Fig. 1.—General View of Hanger.

G. C. Blackmore, 152 Central avenue, Newark, N. J. The two illustrations presented herewith so clearly show its features of construction that only a few words of description will be necessary. Fig. 1 shows the pipe-hanger ready for use, while Fig. 2 shows it with the parts separate. The hanger consists of a hinged stirrup made of cast iron supported by a double hook of the same material, this in turn screwing on to a lag-screw of wrought iron. The upper portion of the lag-screw is cut with a large thread, suitable for screwing into wood, while the lower end has a $\frac{1}{4}$ -inch pipe thread cut on it. The bottom of the lag-screw screws into the socket of the double hook, which is threaded on the inside. The lag-screws are made 4, 6, 9 and 12 inches long; while if any intermediate length is required a screw can be cut off and threaded with an ordinary pipe-fitter's die. At present the hangers are made in four sizes, adapted to 1, $1\frac{1}{4}$, $1\frac{1}{2}$ and 2 inches, but the manufacturer expects soon to make them in all sizes up to 6 inches. The method of supporting the stirrup by



Fig. 2.—Hanger with Parts Separate.

cast-iron hooks permits of a horizontal motion of $2\frac{1}{4}$ inches. In referring to the special merits of this device the manufacturer alludes to the fact that there is no bolt to wear through and drop the pipe; and also that the material from which it is made renders it very cheap. The hangers can, of course, be finished in any manner desired.

Cliff's Seat Spring.

The accompanying illustration represents this article, which is put on the market by Titus & Babcock, Rochester, N. Y. As shown in the cut, it will be observed that the manner in which it is constructed does

means of this leg the lamp is raised about 3 inches from the table. As will be seen, the legs have a slight flare, which gives to the lamp greater firmness and rigidity, rendering it less liable to be overturned. The company furnish these legs separate from the lamps, and they are so simple of



Cliff's Seat Spring.

away with the hinge or knuckle found in other springs, the ends being simply riveted together, and it is to be noted also that it is a graduated seat spring and adapted for one, two or three persons, doing away with the necessity for carrying more than one size in stock. It has also, it will be seen, a chair above and below, which greatly facilitates its attachment, as it can be bolted directly, without fitting a wooden piece, to the seat to which it is applied and the board to which it is fastened. It is described as made of the best quality of steel, and as being soft and easy in its action and in all respects satisfactory.

Novel Stove Leg.

The American Oil Stove Company, of Gardner, Mass., are bringing out their lamp stoves provided with a very simple yet effective leg, the construction of which cannot fail to command the attention of the trade. The company have been engaged for some time past in devising a leg which could be easily and rapidly taken off and put on to their lamp stoves, and in the device which is shown in the accompanying engraving they feel that they have accomplished the object sought. As will be seen from the cut, the top of the leg catches on to the small ribs on the top

construction that they may be readily applied by any one.

Crown Wire Coat and Hat Hooks.

The illustration given below represents a style of wire coat and hat hooks called the Crown, which is put on the market by



Crown Wire Coat and Hat Hook.

the Van Wagoner & Williams Company, 82 Beekman street, New York. It will be observed that it differs in pattern from the Gem hooks and is offered at a somewhat

Commercial Travelers Thirty Years Ago.

We find the following interesting item in a recent issue of the *Crockery and Glassware Journal*:

"It amuses me," said the white-haired head of a jobbing house, "to hear traveling men nowadays complain of the hardships of the road, the taking of late trains, traveling in cabooses, and such like inconveniences. Lord bless you! they should have seen the drummers of the old days and heard their experiences and then they would have known something about the woes of the traveling man. Thirty years ago I was young, ambitious, full of energy, and went on the road for a jobbing house. When I could not travel by river—and that could be done only by going through a certain portion of our trade—stage coaches and horseback were the only means of travel. Many a cold and weary winter's day have I passed in the saddle, starting out early in the morning, going through snow or rain, fording creeks, and half frozen all the time, until I could hardly dismount when my day's journey was over. And then there were no banks or collection agencies through the country to facilitate the collections of debts, and

the drummers had all of that work to do. We traveled with old-fashioned valises, which could be used as saddlebags when we had to ride horseback, and these were the receptacles for what money was collected. It was sometimes pretty ticklish work stopping at lonely country taverns with saddlebags filled with good, hard money, but it had to be done. I slept on the floor in a little tavern office one winter's night with my valise under my head for a pillow, containing over \$1500 cash. It was a hard pillow, but I felt safer with it there, and slept quite soundly. The drummers of to-day don't know what hard traveling is. They should have frozen or half-drowned or starved with us in the old school back in the '50s."

After reading the first accounts of the destruction by floods of the famous Verrugas Bridge, on the Oroya railroad line in Peru, which was 260 feet high, and cost \$500,000, wonder was expressed that such a casualty could occur. Later accounts show that a "cloud burst" caused a mass of rocks and earth to sweep down the mountain, carrying away the bridge.

It is definitely announced that Presidents Adams, of the Union Pacific, and Perkins, of the Burlington, have signed a contract for the construction of a union depot at Omaha to cost \$1,500,000.

The navy yard north of the forty-second parallel of north latitude, on the coast of Oregon, is to be located in Puget Sound, opposite the thriving town of Seattle, where coal and lumber are abundant.



A Novel Stove Leg.

of the oil tank, while a stove bolt goes through the center of the leg at the rosette. To the end of this bolt is a nut which engages behind the small slot shown in the base of the oil tank. By lower price. It is made in sizes 2½, 3 and 3½ inch, and also as a single hook in 2-inch size. They are furnished either coppered or japanned, and are put up half gross in a box or 12 gross in a case.

Legal Decisions

ATTACHMENT OF GOODS ON STORAGE FOR LIENS ON WAREHOUSE.

H., a sheriff, had placed in his hands a writ of attachment against the goods in the stores of the Garden City Warehouse Company, to secure to the attaching creditor the storage charges on the goods, the company having liens thereon. These storage rates were collected by H., but he paid them over to the debtor, on the ground that he could not make a lawful levy on them, as they were not subject to attachment. The creditor then sued the sheriff for the amount of the charges collected—*First National Bank of Chicago vs. Hanchett*—but was defeated, and an appeal was taken to the Supreme Court of Illinois, where the judgment was reversed. The Chief Justice, Sheldon, in the opinion said: "Conceding that the goods in the warehouse were not subject to attachment for the debts of the warehouse company, we are of the opinion that there was a dereliction of official duty on the part of the sheriff with respect to the storage collected. This money, so paid to him by the owners of the goods, was not his money; it was the money of the attachment debtor. It was paid to the sheriff on account of the debtor, and was received for his account. The officer was commanded by the statute to attach the money of the attachment debtor, and this money of the debtor we think he should have attached or have held the same as attached. If this money in the sheriff's hands was not strictly property of the warehouse company, which could not be seized in attachment, it might have been held and brought into court by the sheriff to answer to the judgment in attachment, as the court might direct. This certainly would be in the spirit of the attachment, with reference to the appropriation of credits on attachment, which directs that credits shall be attached, and this court has said that the attachment act shall be liberally construed. Had the sheriff held the money subject to the order of the court all would have been well, but he did not hold it. He did not obey the instructions of the attaching creditor, whose official agent he was, and he cannot justify his course by assuming the power of the court in determining to whom the money collected belonged. He is liable for the amount of the storage charges collected, and he must pay them over to the plaintiff."

TRADE ASSOCIATIONS.

D. was a member of the New York Stock Exchange, and becoming insolvent he was suspended by its Governing Committee, who determined that his failure was caused by doing business in a reckless and unbusiness-like manner. It was resolved by the committee that D. was ineligible for readmission, and the exchange, pursuant to its constitution and by-laws, disposed of his membership and seat for \$25,000, and refused to pay it over to B., to whom D. had assigned the seat. The creditors of D. in the exchange claimed the proceeds of the seat under the rules of the exchange, and they were distributed among them. B. sued the president of the exchange for the proceeds of the seat, and the answer was set up that under the constitution and by-laws of the exchange the proceeds had been duly distributed among D.'s creditors in the exchange. B. in reply asked judgment in his favor on the ground that the answer was not a sufficient defense, but the court decided against him, and he carried the case—*Belton vs. Hatch*—to the Court of Appeals of New York, where he was again defeated. Judge Gray in the opinion said: "The judgment must stand. The New York

Stock Exchange is a voluntary association; it is not a partnership. It may be said, however, that the rights of the associates are not substantially different from those of partners so far as their rights in the property of the association are concerned. The interest of each member in the property of the association is equal, but it is subject to the constitution and by-laws, which are the basis on which is founded the association. They express the contract by which each member has consented to be bound, and which measures his duties, rights and privileges as such. It seems most clear to me that this constitution and by-laws derive a binding force from the fact that they are signed by all of the members, and that they are conclusive upon each of them in respect of the regulations of the mode of transaction of his business and of his right to continue to be a member. Whatever are the rights acquired by a member and created by his admission to membership, the rules by which the membership is created or dissolved and which control the officers of the organization, and the relations of the members entered into those rights when created and remained a part of them. There is nothing in this against public policy, for the reason that whatever the member acquires is subject to the self-imposed condition that his title and the rights which accrue from his membership are regulated by and are dependent upon the laws adopted by the association, and expressly consented to by him when he joined. If the constitution which forms the basis of this association appropriates to his creditors in the association or to any of its corporate objects the peculiar property of the member who, by force of constitutional provisions, has lost his membership, that was an incident entering into his title in it. D. must be held to his contract, and B. took no greater rights by the assignment."

CONTRACT IN RESTRAINT OF TRADE.

N. sold sand, and he refused to sell a piece of land in which there was a deposit of sand on the ground that it would interfere with his business by enabling the purchaser to sell sand in competition with him. But at last he agreed to let the land go on the condition that it should be stipulated in the deed by a warranty that the grantee should "not sell any sand off the said premises." The deed was so made, but the person to whom this land was subsequently sold, claiming that this covenant did not run with the land, sold sand dug from the lot. N.'s executor then brought suit to restrain the last owner, S., from selling this sand, but he was defeated, and he carried the action—*Hodge vs. Sloan*—to the Court of Appeals of New York, where he had the judgment reversed. Judge Danforth, in the opinion, said: "The defendant insists that this covenant is in restraint of trade, and the court below has sustained this view. This conclusion is against our ideas of natural justice, for it takes from one party an advantage which he refused to sell, and secures to the other, without price, a privilege which his grantor was unable to buy. Nor do we think that this denial of private right is required by any rule of public policy. If we assume with defendant that the covenant is in restraint of trade, still it is valid if it imposes no restriction upon one party which is not beneficial to the other, and was induced by a consideration which made it reasonable for the parties to enter into it, or in other words, if it was a proper and useful contract or such as could not be disregarded without injury to a fair contractor."

The future lumber supply of the United States will, according to Gov. Russell Alger, be solved by the Nicaragua

Canal project. The Michigan and Wisconsin pine lands are being rapidly denuded, and but for the high freights by rail the Eastern market would even now be supplied from Washington Territory, where the forests abound in fir of a superior quality as Mr. Alger learns from personal observation. He says: "I think I am a fair judge of timber and I don't hesitate in pronouncing the product of these regions in every way superior to our Northern pine, and other countries recognize the fact. While I was in Tacoma I saw nine vessels, bound for England, Germany and China, loading at the wharves. I know that at the present time," he continued, "it cannot be profitably carried East by rail, because I have figured the matter with the roads touching that district, and it has been found impossible to carry the stuff 2000 miles at anything like a reasonable rate. If the canal is ever built, an enormous lumber traffic by water will surely spring up, and it will possibly come just at the time we need it most."

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CURRENT HARDWARE PRICES.

APRIL 29, 1889.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

Ammunition.

Caps, Percussion, # 1000—	
Hicks & Goldmark's	
F. L. Waterproof, 1-10's.....	50¢
E. B. Trimmied Edge, 1-10's.....	25¢
E. B. Grnd. Edge, 1-10's.....	75¢
Double Waterproof, 1-10's.....	1.10
Musket Waterproof, 1-10's.....	50¢
G. D.....	25¢
S. B.....	30¢
Union Metallic Cartridge Co.	
F. C. Trimmied.....	50¢
F. L. Ground.....	25¢
Cent. Fire Ground.....	70¢
Db. Waterproof.....	1.10
Db. Waterproof, in 1-10's.....	1.10
S. B. Genuine Imp.orted.....	45¢
Eley's D. Waterproof, Central Fire.....	1.00

Cartridges.

Rim Fire Cartridges.....	50¢&52¢
Rim Fire Military.....	15¢&2¢
Cent. Fire, Pistol and Rifle.....	25¢&52¢
Cent. Fire, Military and Sporting.....	15¢&52¢
Blank Cartridges, except 22 and 32 cal., additional 10¢ on above discounts.	
Blank Cartridges, 22 cal.....	2¢
Blank Cartridges, 32 cal.....	3.50
Primed Shells and Bullets.....	15¢&52¢
B. B. Caps, Round Ball, 1.75.....	2¢
B. B. Caps, Con. Ball, Swgd., 2.00.....	2¢

Primers.

Berdan Primers, 1.00.....	25¢
B. L. Caps (for Sturtevant Shells) 1.00.....	25¢

All other Primers, 1.20..... 25¢

Shells.

First quality, 4, 8, 10 and 12 gauge.....	25¢&10¢
First quality, 14, 16 and 20 gauge (10 list).....	30¢&10¢
Star, Club, Rival and Climax brands, 14, 16 and 20 gauge.....	33¢&10¢
Club, Rival and Climax brands, 14, 16 and 20 gauge.....	30¢&10¢
Selbold's Comb. Shot Shells.....	15¢&2¢
Brass Shot Shells, 1st quality.....	60¢&2¢
Brass Shot Shells, Club, Rival, Climax.....	65¢&2¢
1 X L, 10 and 12 gauge.....	40¢&52¢
"Special," 16 gauge.....	30¢&10¢
"Special," 10 and 12 gauge.....	40¢&10¢
Fowler's Pat.....	35¢

Shells Loaded.

A. M. Co. List No. 19, 1887.....	20¢&10¢
Wads—	
U. M. C. & W. R. A.—B. E., 11 up.....	2.00
U. M. C. & W. R. A.—B. E., 9&10.....	2.30
U. M. C. & W. R. A.—B. E., 7&8.....	2.50
U. M. C. & W. R. A.—P. E., 11 up.....	3.10
U. M. C. & W. R. A.—P. E., 9&10.....	4.00
U. M. C. & W. R. A.—P. E., 7&8.....	4.00
Eley's B. E., 11 up.....	1.75
Eley's P. E., 11 up.....	2.50

Anvils.

Eagle Anvils, # 10.....	20¢&30¢
Peter Wright's.....	5¢
Armstrong's Mouse Hole.....	8¢
Armstrong's Mouse Hole, Extra 11½.....	11¢
Trenton.....	9¢
Wilkinson's.....	9¢
J. & Riley Carr, Pat. Solid.....	11¢
Moore & Barnes Mfg. Co.....	33¢
Anvil Vise and Drill—	
Millers Falls Co., 18.00.....	20¢
Cheney Anvil and Vise.....	25¢
Allen Anvil and Vise.....	40¢&10¢

Apple Parers.

Advance.....	50¢
Antrim Combination.....	50¢
Baldwin.....	50¢
Champion.....	75¢
Eureka, 1888.....	17.00
Family Bay State.....	12.00
Gem.....	5.00
Gold Medal.....	4.00
Hudson's New '88.....	3.75
Ideal.....	4.75
Improved Bay State.....	30.00
Little Star.....	5.00
Monarch.....	13.00
New Lightning.....	5.50
Oriole.....	4.00
Penn.....	4.00
Perfection.....	4.00
Pomona.....	4.00
Rocking Table.....	4.00
Turntable.....	4.50
Victor.....	13.50
Waverly.....	4.50
White Mountain.....	4.50
72.....	4.25
76.....	5.75
78.....	6.50

Augers and Bits.

Douglas Mfg. Co.....	
Wm. A. Ives & Co.....	70¢
Humphreysville Mfg. Co.....	
French, Swift & Co. (F. H. Beecher), Cook's, Douglas Mfg. Co.....	55¢
Cook's, N. H. Copper Co. 50¢&10¢&50¢&10¢	
Ives' Circular Lip.....	30¢
Patent Solid Head.....	40¢
C. E. Jennings & Co., No. 10, extension lip.....	40¢
C. E. Jennings & Co., No. 30.....	60¢
C. E. Jennings & Co., Auger Bits set 32½ quarters, No. 5, No. 30, 35.50, 20¢	
Lewis' Patent Single Twist.....	45¢
Jennings' Augers and Bits.....	25¢
Imitation Jennings' Bits.....	60¢
Pugh's Black.....	20¢
Car Bits.....	50¢&10¢
L. Hommedieu Car Bit.....	15¢
Forstner Pat. Aug Bits.....	10¢

Hollow Augers.

Ives'.....	25¢&10¢
French, Swift & Co.....	25¢&10¢
Bonney's Adjustable, # doz 48.....	40¢&10¢
Stearns'.....	20¢&10¢
Ives' Expansive, each \$4.50.....	50¢&5¢
Universal Expansive, each \$4.50.....	30¢
Wood's.....	25¢&10¢

Expansive Bits.

Clarks' small, #18; large, #26.....	35¢&35¢
Ives' No. 4, # doz 400.....	40¢
Swan's.....	40¢
Stearns' No. 1, #20; No. 2, #22.....	35¢
Stearns' No. 2, #48.....	20¢

Gimlet Bits.

Common.....	25¢
Diamond.....	25¢
Bee.....	25¢
Double Cut, Shephardson's.....	45¢
Double Cut, Ct. Valley Mfg. Co.....	30¢
Double Cut, Hartwell's, # gro.....	5.25
Double Cut, Douglas.....	40¢
Double Cut, Ives.....	60¢

Bit Stock Drills.

Morse Twist Drills.....	50¢&10¢
Standard.....	50¢&10¢
Cleveland.....	50¢&10¢
Syracuse, for metal.....	50¢&10¢
Syracuse, for wood (wood list).....	30¢
Williams' or Holt's, for metal.....	50¢&10¢
Williams' or Holt's, for wood.....	40¢&10¢

Ship Augers and Bits.

L'Hommiedieu's.....	15¢&10¢
Watrous.....	15¢&10¢
Snell's.....	15¢&10¢
Snell's Ship Auger Pat'n Car Bits.....	15¢&10¢

Awl Hafts.

Sewing, Brass Fer. # gr. 35.50.....	45¢
Pat. Sewing, Long.....	40¢
Pat. Peg, Plain Top.....	45¢
Pat. Peg, Leather Top.....	45¢

Awls, Brad Sets, &c.

Awls Sewing, Common # gr 1.70, 35¢	
Awls, Should. Peg, # gr 2.45.....	40¢
Awls, Pat. Peg.....	40¢
Awls, Shouldered Brad.....	35¢
Awls, Handled Brad.....	45¢
Awls, Handled Scratch # gr. 75.50, 35¢	
Awls, Socket Scratch, # doz, 15.00, 25¢	

Awl and Tool Sets.

Alken's Sets, Awls and Tools.....	
No. 20, # doz 10.00.....	55¢
Fray's Adj. Tool Hds., Nos. 1, 2, 18; 3, 12; 4, 8.....	25¢
No. 1, 2, 18.....	25¢
Henry's Combination Haft.....	25¢
Brad Sets.....	
No. 42, 10.50; No. 43, 12.50.....	70¢
Stanley's Excelsior.....	
No. 1, 7.50; No. 2, 8.40; No. 3, 8.50.....	30¢

Axes.

Makers' and Special Brands—	
First quality.....	50¢
Others.....	50¢

Axle Grease.

Fraser's.....	4¢
Fraser's, in boxes.....	4¢
Dixon's Everlasting, in bxs.....	1¢
Dixon's Everlasting.....	1¢
Lower grades, special brands.....	5¢

Axles.

No. 1.....	4¢
Nos. 7 to 14.....	55¢
Nos. 15 to 18.....	47¢
Nos. 19 to 22.....	70¢
National Tubular Self-Oiling: Standard Farm (1 to 5) and Special Farm (A1 to A5).....	
Less than 10 sets.....	39¢
Over 10 sets.....	39¢

Bag Holders.

Sprengle's Pat.....	18¢
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Balances.

Spring Balances.....	50¢
Common 24-lb.....	1.50
Chattillon's Spring Balances.....	50¢
Chattillon's Circular Spring Balances.....	60¢

Bells.

Hand—	
Light Brass.....	70¢
White Metal.....	60¢
Silver Chime.....	33¢
Globe (Cone's Patent).....	25¢
Door—	
Gong, Abbe's.....	33¢
Gong, Yankee.....	45¢
Gong, Barton's.....	40¢
Crank, Taylor's.....	25¢
Crank, Brooks.....	50¢
Crank, Cone's.....	10¢

Crank, Connel's.....	20¢
Lever, Sargent's.....	60¢
Lever, Taylor's Brouzed or Plated.....	25¢
Lever, Taylor's Japanned.....	25¢
Lever, R. E. M. Co's.....	50¢
Pull, Brook's.....	50¢
Pull, Western.....	25¢

Common Wrought.....	60¢
Western.....	20¢
Western, Sargent's list.....	70¢
Kentucky, "Star".....	20¢
Kentucky, Sargent's list.....	70¢
Dodge, Genuine Kentucky.....	70¢
Texas Star.....	50¢
Call.....	40¢
Farm Bells.....	3¢
Steel Alloy Church and School Bells.....	40¢

Bellows.

Blacksmiths'.....	50¢
Molders'.....	40¢
Hand Bellows.....	40¢

Belt, Rubber.

Common Standard.....	70¢
Standard.....	70¢
Extra.....	60¢
N. Y. B. & P. Co., Carbon.....	60¢
N. Y. B. & P. Co., Diamond.....	60¢

Bench Stops.

Morrill's.....	50¢
Hotchkiss's.....	50¢
Weston's, No. 1, #10; No. 2, #9.....	25¢
McGill's.....	30¢

Bits.

Auger, Gimlet, Bit Stock, Drills, &c., see Augers and Bits.	
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Bit Holders.

Extension.....	40¢
Barber's.....	40¢
Ives, # doz 20.00.....	40¢
Diagonal.....	40¢
Angular.....	40¢

Blind Adjusters.

Domestic.....	30¢
Excelsior.....	30¢
Washburn's Self-Locking.....	20¢

Blind Fasteners.

Mackrell's.....	20¢
Van Sand's Screw Pat., #15 # gr.....	60¢
Van Sand's Old Pat., #15.00 # gr.....	55¢
Washburn's Old Pattern, # gr.....	50¢
Merriman's.....	new list
Austin & Eddy No. 3008, # gr.....	20¢
Security Gravity, # gr.....	20¢

Blind Staples.

Barbed, ½ in. and larger.....	7½¢
Barbed, ¾ in.....	8½¢

Blocks.

Cleveland Block Co., Mal. Iron.....	50¢
Moore's Novelty, Mal. Iron.....	60¢

Boils.

Door and Shutter.

Cast Iron Barrel, Square, &c.....	70¢
Cast Iron Shutter Bolts.....	70¢
Cast Iron Chain (Sargent's list).....	65¢
Ives' Patent Door Bolts.....	60¢
Wrought Square.....	70¢
Wrt Shutter, all Iron, Stanley's.....	60¢
Wrt Shutter, Brass Knob.....	40¢
Wrt Shutter, Sargent's list.....	60¢
Wrt Sunk Flush, Sargent's list.....	55¢
Wrt Sunk Flush, Stanley's list.....	50¢
Wrt B.K. Flush, Com'n.....	55¢

Carriage, Machine, &c.

Com. list June 10, '84.....	75¢
Philina Eagle, list Oct., '84.....	75¢
Philina, pattern, list Oct. 7, '84.....	75¢
R.B.&W., old list.....	75¢
Machine, according to size.....	75¢
Bolt Ends, according to size.....	75¢

Tire.

Common, list Feb. 28, '83.....	70¢
Port Chester Bolt and Nut Company: Empire, list Feb. 28, '83.....	70¢
Phila., list Oct. '84.....	82½¢
Keystone, Philadel., list Oct. '84.....	60¢
Norway, Phila., list Oct. '84.....	75¢
American Screw Company: Norway, Phil., list Oct. 16, '84.....	75¢
Eagle, Phil., list Oct. 16, '84.....	80¢
Philadel., list Oct. 16, '84.....	82½¢
Bay State, list Feb. 28, '83.....	70¢
R.B.&W., Philadel., list Oct. 16, '84.....	82½¢

Stove and Plow.

Stove.....	65¢
Plow.....	60¢
R. B. & W., Plow.....	60¢

Borax.

Boring Machines.

Without Augers.....	5.50
Upright.....	6.75
Angular.....	6.75
Douglas.....	5.50
Snell's, Rice's Pat. 5.50.....	6.75
Jennings.....	5.50
Other Machines.....	2.35
Phillips' Patent with Augers.....	7.00

Bow Pins.

Humason, Beckley & Co's.....	90¢
Sargent & Co's.....	17¢
Peck, Stow & W. Co.....	50¢

Braces.

Barber's.....	
Nos. 10 to 16.....	50¢
Nos. 30 to 33.....	50¢
Nos. 40 to 63.....	50¢
Barker's.....	
Nos. 8, 10 and 12.....	75¢
Plated, Nos. 8, 10 and 12.....	85¢
Osgood's Ratchet.....	40¢
Spofford's.....	50¢
Ives' New Haven Novelty.....	70¢
New Haven Ratchet.....	60¢
Barber Ratchet.....	60¢
Barber's.....	60¢
Spofford.....	60¢
Common Bail, American.....	1.10
Bartholomew's.....	
Nos. 25, 27 and 30.....	50¢
Nos. 117, 118, 119.....	70¢
Amidon's.....	
Barker's Imp'd Plain.....	75¢
Barker's Imp. Nickled.....	85¢
Ratchet.....	75¢
Eclipse Ratchet.....	60¢
Globe Jawed.....	40¢
Corner Brace.....	40¢
Universal, 8 in., 12 in.....	22¢
Buffalo Bail.....	1.10
P. S. & W.....	50¢

Brackets.

Cards—

Horse & Curry.....10¢10¢10¢10¢
 Cotton.....10¢10¢10¢10¢
 Wool.....10¢10¢10¢10¢

Carpet Stretchers—

Cast Steel, Polished.....\$ doz \$2.25
 Cast Iron, Steel Points.....\$ doz \$2.00
 Socket.....\$ doz \$1.75
 Bullard's.....25¢25¢10¢

Carpet Sweepers—

Bissell No. 5.....\$ doz \$17.00
 Bissell No. 7 New Drop Pan.....\$ doz \$19.00
 Bissell, Grand.....\$ doz \$36.00
 Grand Rapids.....\$ doz \$24.00
 Crown Jewel, No. 1, \$18.00; No. 2, \$19.00
 Magic.....\$ doz \$15.00
 Jewel.....\$ doz \$17.00
 Improved Parlor Queen, Nickleod.....\$ doz \$27.00
 Japanned.....\$ doz \$24.00
 Excelsior.....\$ doz \$22.00
 Garland.....\$ doz \$18.00
 Parlor Queen.....\$ doz \$24.00
 Housewife's Delight.....\$ doz \$16.00
 Queen.....\$ doz \$18.00
 Queen, with band.....\$ doz \$18.00
 King.....\$ doz \$30.00
 Weed, Improved.....\$ doz \$18.00
 Hub.....\$ doz \$16.00
 Cog-Wheel.....\$ doz \$22.00
 Conqueror.....\$ doz \$22.00
 Easy.....\$ doz \$22.00
 Monarch.....\$ doz \$22.00
 Goshen.....\$ doz \$21.00
 Advance.....\$ doz \$18.00
 Ladies' Friend, No. 1, \$15.00; No. 2, \$16.00
 American.....\$ doz \$15.00
 Grand Republic.....\$ doz \$35.00

Cartridges—

See Ammunition.

Casters—

Bed.....\$ Brass.....55¢55¢55¢
 Plate.....\$ Others.....60¢60¢60¢
 Shallow Socket.....40¢10¢
 Deep Socket.....40¢10¢
 Yale Casters, list May, 1884.....30¢10¢40¢
 Yale, Gem.....40¢60¢55¢
 Martin's Patent (Phoenix).....45¢10¢50¢
 Payson's Anti-friction.....60¢60¢10¢
 Giant Truck Casters.....30¢
 Stationary Truck Casters.....50¢10¢
 Socket Truck Casters.....50¢

Cattle Leaders—

Humason, Beckley & Co.'s.....70¢
 Sargent's.....60¢5¢10¢
 Hotchkiss.....30¢
 Peck, Stow & W. Co.....50¢10¢

Chain—

Trace, 6½-10-2, exact, \$ pair, \$1.05.....50¢10¢50¢10¢5¢
 Trace, 6½-10-3, exact, \$ pair \$2.....50¢10¢50¢10¢5¢
 Trace, 7-10-2, exact, \$ pair \$1.11.....50¢10¢50¢10¢5¢
 North—Traces, "Regular" sizes, 3¢ net \$ pair less than exact.....50¢10¢50¢10¢5¢
 Log, Fifth, Stretcher, and other fancy Chains, list Nov. 1, 1884.....50¢10¢50¢10¢5¢
 American Coil, in cask lots, 3-16 ¼ 5-16 ¼ 7-16 ¼ 9-16 ¼ \$8.75 6-25 5.00 4.50 4.40 4.00 3.75 3.50
 Less than cask lots, add ¼¢ per lb. \$ lb.
 German Coil, list of June 20, 1887.....50¢10¢50¢10¢5¢
 German Halter Chain, list of June 20, 1887.....50¢10¢50¢10¢5¢
 Covert Halter, Hitching and Breast.....50¢25¢
 Covert Traces.....35¢25¢
 Oneida Halter Chain.....60¢60¢5¢
 Galvanized Pump Chain.....\$ 5¢5¢6¢
 Jack Chain, Iron.....75¢75¢5¢
 Jack Chain, Brass.....70¢70¢5¢

Chalk—

White.....\$ gr 50¢
 Red.....\$ gr 70¢
 Blue.....\$ gr 85¢
 See also Crayons.

Chalk Lines—

See Lines.

Chisels—

Socket Framing and Firmer, P. S. & W.....\$ 75¢5¢75¢10¢
 New Haven.....\$ 75¢5¢75¢10¢
 Witherby.....\$ 75¢5¢75¢10¢
 Mix.....\$ 75¢5¢75¢10¢
 Ohio Tool Co.....\$ 75¢5¢75¢10¢
 Douglas.....\$ 75¢5¢75¢10¢
 Buck Bros.....\$ 60¢10¢60¢10¢5¢
 Merrill.....\$ 60¢10¢60¢10¢5¢
 L. & I. J. White.....\$ 30¢30¢5¢
 Tanged and Miscellaneous, 40¢10¢
 Butcher's.....\$ 4.75¢45¢.00
 Spear & Jackson's.....\$ 5 to 2
 Buck Bros.....\$ 30¢
 Cold Chisels, \$ lb.....16¢19¢

Chucks—

Reach Pat.....each, \$8.00, 20¢
 Morse's Adjustable, each, \$7.00, 20¢20¢5¢
 Danbury.....each, \$6.00, 30¢30¢5¢
 Syracuse, Bala Pat.....25¢

Clamps—

R. I. Tool Co.'s Wrought Iron.....25¢
 Adjustable, Gray's.....20¢
 Adjustable, Lambert's.....20¢
 Adjustable, Snow's.....40¢5¢
 Adjustable, Hammers.....15¢
 Adjustable, Stearn's.....30¢10¢
 Stearn's Adjustable Cabinet and Corner.....20¢10¢
 Cabinet, Sargent's.....60¢5¢10¢
 Carriage Makers', Sargent's.....70¢10¢
 Eberhard Mfg. Co.....40¢5¢40¢10¢
 Warner's.....40¢10¢40¢10¢5¢
 Saw Clamps, see Vises

Clips—

Norway, Axle, ¼ & 5-16.....55¢55¢5¢
 2nd grade Norway Axle, ¼ & 5-16.....65¢5¢
 Superior Axle Clips.....65¢5¢60¢5¢5¢
 Norway Spring Bar Clips, 5-16, 60¢5¢5¢
 Wrought Iron Felloe Clips.....\$ 5¢5¢
 Steel Felloe Clips.....\$ 5¢5¢
 Baker Axle Clips.....25¢

Cockeyes—

50¢

Cocks, Brass.

Hardware list.....40¢10¢25¢

Coffee Mills—

Box and Side, list Jan. 1, 1888.....50¢25¢
 American, Enterprise Mfg Co. 20¢10¢30¢
 The Swift, Lane Bros.....20¢10¢

Compasses Dividers, &c—

Compasses, Calipers, Dividers, 70¢70¢10¢
 Bemis & Call Co.'s.....60¢5¢
 Dividers.....50¢5¢
 Wing and Inside or Outside.....50¢5¢
 Double.....60¢
 (Call's Pat. Inside).....30¢
 Excelsior.....50¢
 J. Stevens & Co.'s.....25¢10¢
 Starrett's.....25¢10¢
 Spring Calipers and Dividers 25¢10¢10¢
 Lock Calipers and Dividers.....25¢10¢
 Combination Dividers.....25¢10¢

Coopers' Tools—

Bradley's.....20¢
 Barton's.....20¢20¢5¢
 L. & I. J. White.....25¢
 Albertson Mfg. Co.....25¢
 Beatty's.....30¢
 Sandusky Tool Co.....30¢30¢5¢

Corkscrews—

Humason & Beckley Mfg. Co. 40¢40¢10¢
 Clough's Pat.....33¢33¢5¢
 Howe Bros & Hulbert.....35¢

Cork Knives and Cutters—

Bradley's.....10¢
 Wadsworth's.....25¢

Cradles—

Grain.....50¢25¢

Crayons.

White Crayons, \$ gr 12¢12¢12¢.....10¢
 M. S. Mfg. Co. Metal Workers, \$ gr \$2.50.....25¢
 M. S. Mfg. Co., Rolling Mill, \$ gr \$2.50.....25¢
 See also Chalk.

Crow Bars—

Cast Steel.....\$ 4¢
 Iron, Steel Points.....\$ 3¢5¢

Curry Combs—

Fitch's.....50¢10¢50¢10¢10¢
 Rubberper doz \$10.00.....20¢
 Perfect.....50¢

Curtain Pins—

Silvered Glass.....net
 White Enamel.....net

Cutlery—

Beaver Falls & Booth's.....33¢
 Wostenholme.....\$ 7.75 to 2

Dampers, &c—

Dampers, Buffalo.....50¢
 Buffalo Damper Clips.....60¢
 Crown Damper.....40¢
 Excelsior.....40¢10¢

Dividers—

See Compasses.

Dog Collars—

Embossed, Gilt, Pope & Steven's list.....30¢10¢
 Leather, Pope & Steven's list.....40¢
 Brass, Pope & Steven's list.....40¢

Door Springs—

Torrey's Rod, regular size.....\$ doz \$1.30
 Gray's, \$ gr.....\$20.00, 20¢
 Bee Rod \$ gr.....\$20.00, 20¢
 Warner's No. 1, \$ doz, \$2.50; No. 2, \$3.30.....40¢10¢50¢
 Gem (Coll.) list April 19, 1886.....10¢
 Star (Coll.) list April 19, 1886.....20¢
 Victor (Coll.).....60¢60¢10¢
 Champion (Coll.).....60¢10¢60¢10¢10¢
 Philadelphia, 5 in., \$5.00; 8 in., \$7.75.....\$ 15.00
 Cowl's No. 1, \$ doz, \$18.00; No. 2, \$15.00.....25¢10¢40¢
 Rubber, complete, \$ doz, \$4.50.....55¢10¢
 Hercules.....50¢
 Shaw Door Check and Spring, 25¢30¢35¢

Drawing Knives—

Witherby.....\$ 75¢5¢
 P. S. & W.....\$ 75¢10¢
 Mix.....\$ 75¢10¢
 Merrill.....\$ 60¢10¢60¢10¢5¢
 Douglas.....\$ 75¢5¢5¢
 Watrous.....\$ 15¢10¢25¢
 L. & I. J. White.....\$ 20¢5¢
 Bradley's.....\$ 35¢
 Adjustable Handle.....25¢35¢
 Wilkinson's Folding.....25¢5¢5¢

Drills and Drill Stocks—

Blacksmiths' Self-Feeding, each \$1.75.....\$ 1.75
 Breast, P. S. & W.....40¢10¢
 Breast, Wilson's.....30¢5¢
 Breast, Millers Falls.....each \$3.00, 25¢
 Breast, Bartholomew's.....each \$2.50, 25¢10¢40¢
 Ratchet, Merrill's.....20¢20¢5¢
 Ratchet, Ingersoll's.....25¢
 Ratchet, Parker's.....20¢20¢5¢
 Ratchet, Whitney's.....20¢10¢
 Ratchet, Weston's.....20¢25¢
 Ratchet, Moore's Triple Action.....25¢30¢
 Whitney's Hand Drill, Plain, \$11.00; Adjustable, \$12.00.....20¢10¢
 Wilson's Drill Stocks.....10¢
 Automatic Boring Tools.....\$ 1.75¢\$1.85

Twist Drills—

Morse.....50¢10¢5¢
 Standard.....50¢10¢5¢
 Syracuse.....50¢10¢5¢
 Cleveland.....50¢10¢5¢
 Williams.....50¢10¢10¢
 New Process.....50¢10¢5¢

Drill Bits.—See Augers and Bits.**Drill Chucks.—See Chucks.****Dripping Pans—**

Small sizes.....\$ 3¢4¢
 Large sizes.....\$ 3¢4¢

Egg Beaters.

Dover.....\$ doz \$1.50
 National \$ doz \$4.50.....\$ 33¢5¢
 Family (T. & S. Mfg. Co.), \$ gro \$17.00

Duplex (Standard Co.).....\$ gro \$15.00
 Rival (Standard Co.).....\$ gro \$12.00
 Large Duplex (Standard Co.), \$ doz \$4.50
 Triumph (T. & S. Mfg. Co.), \$ gro \$10.50

Advance, No. 1.....\$ gro \$10.50
 Advance, No. 2.....\$ gro \$10.00
 Bryant's.....\$ gro \$15.00
 Ayres' Spiral.....\$ gro \$5.00
 Double (H. & R. Mfg. Co.).....\$ gro \$16.20
 Easy (H. & R. Mfg. Co.).....\$ gro \$14.00
 Triple (H. & R. Mfg. Co.).....\$ gro \$16.20
 Spiral (H. & R. Mfg. Co.).....\$ gro \$4.50
 Paine, Diehl & Co.'s.....\$ gro \$24.00

Egg Poachers—

Buffalo Steam Egg Poachers, \$ doz, No. 1, \$6.00; No. 2, \$9.00.....25¢

Electric Bell Sets.—

Wollensak's.....20¢
 Bigelow & Dowse.....20¢

Emery—No. 4 to No. 54 to Flour, CF

46 gr. 150 gr. F FF.
 Kegs, \$ lb.....45¢ 5¢ 2½¢
 ½ kegs, \$ lb.....45¢ 5¢ 2½¢
 ¼ kegs, \$ lb.....5¢ 5¢ 3¢
 10 lb cans, 10¢
 In case, 6¢ 6¢ 5¢
 10 means, less than 10.....10¢ 10¢ 7½¢

Enamelled and Tinned Ware—

See Hollow-Ware.

Escutcheon Pins—

Iron, list Nov. 11, 1885.....50¢10¢50¢10¢5¢
 Brass.....60¢60¢5¢

Escutcheons.

Door Lock.....Same dis as Door Locks.
 Brass Thread.....80¢60¢10¢
 Wood.....25¢

Faucets.—

Fenn's.....40¢
 Star, Metal Plug, new list.....40¢
 Fenn's Cork Stops.....35¢
 Star.....60¢
 Frary's Pat. Petroleum.....40¢5¢2¢
 B. & L. B. Co.....40¢
 West's Lock, Open and Shut Key.....50¢
 Star, Metal Plug, new list.....40¢
 Lockport, Metal Plug, reduced list.....60¢
 Metallic Key, Leather Lined.....80¢10¢
 Cork Lined.....60¢10¢10¢
 Burnside's Red Cedar.....70¢5¢70¢10¢
 Burnside's Red Cedar, bbl lots.....50¢10¢
 John Somers'.....40¢
 Peerless Best Block Tin Key.....40¢
 IXL, list quality, Cork Lined.....50¢
 Diamond Lock.....40¢
 Perfection, Fla. Red Cedar.....50¢
 Goodenough Cedar.....50¢
 Boss Metallic Key.....50¢
 Reliable Cork Lined.....60¢
 Western Pattern Cork Lined.....60¢

Felloe Plates.—

Enterprise, \$ doz \$50.00.....20¢10¢
 Lane's, \$ doz \$36.00.....25¢10¢
 Victor, \$ doz \$36.00.....25¢10¢

Felloe Wheels.—

Derby and Cincinnati.....4¢4¢5¢

Files—

Domestic—
 Nicholson Files, Raps, &c.....60¢10¢60¢
 Nicholson (X. F.) Files.....10¢5¢
 Nicholson's Royal Files (Seconds).....75¢
 (extra prices on certain sizes)
 Other makers, best brands.....60¢10¢60¢10¢10¢
 Fair brands.....60¢10¢10¢70¢
 Second quality.....70¢10¢75¢10¢
 Nicholson's Horse Raps.....60¢10¢60¢
 10¢5¢
 Heller's Horse Raps.....50¢75¢50¢10¢
 McCaffrey's Horse Raps.....50¢10¢
 Imported—
 J. & Riley Carr.....list, April 1, 1883, 15¢
 J. & Riley Carr Horse Raps.....15¢
 Moss & Gamble.....list, April 1, 1883, 15¢
 Butcher's list, 20¢
 Stubbs.....Stubbs list, 25¢30¢
 Turton's.....Turton's list, 20¢25¢
 Greaves' Horse Raps.....American list, 60¢

Fluting Machines—

Knox, ¼-inch Rolls.....\$3.25 each 35¢
 Knox, ½-inch Rolls.....\$3.60 each 35¢
 Eagle, ¾-inch Roll, \$2.85.....35¢
 Crown, ¼ in., \$3.50; 6 in., \$4.00; 8 in., \$6.50 each.....35¢
 Crown Jewel, 6 in.....\$3.50 each, 35¢
 American, 5 in., \$3.00; 6 in., \$3.40; 7 in., \$4.50 each.....35¢
 Domestic Fluter.....each, \$1.50
 Geneva Hand Fluter, White Metal.....\$ doz \$12, 25¢
 Crown Hand Fluter, No. 1, \$11.00, 25¢
 \$12.50; \$14.....30¢
 Shepard Hand Fluter, No. 83 \$ doz \$15.30.....40¢
 Shepard Hand Fluter, No. 110 \$ doz \$11.00.....40¢
 Shepard Hand Fluter, No. 96 \$ doz \$11.00.....40¢
 Clark's Hand Fluter \$ doz \$15.00.....35¢
 Combined Fluter and Sad Iron.....\$ doz \$15.00, 30¢
 Buffalo.....\$ doz \$10.00, 10¢

Fluting Scissors—

Blair's.....\$ doz \$2.00
 Blair's "Climax".....\$ doz \$1.25

Forks—

Hay, Manure, &c. Asso. list.....65¢
 Hay, Manure, &c. Phila. list 60¢60¢5¢
 Plated, see Spoons.

Freezers, Ice Cream—

Buffalo Champion.....60¢10¢5¢
 Shepard's Lightning.....60¢5¢5¢
 White Mountain.....50¢20¢5¢
 New Arctic.....50¢40¢5¢
 American.....60¢
 Gem.....65¢
 Blizzard.....70¢
 Double Action Crown.....60¢
 Crown.....60¢
 Star.....60¢
 Peerless and Glant.....60¢10¢
 Zero and Pet.....65¢10¢
 Boss.....55¢10¢10¢

Fruit and Jelly Presses—

Enterprise Mfg. Co.....30¢10¢30¢
 Henis.....\$ doz \$3.75¢\$4.00
 P. D. & Co.....\$ doz \$3.75¢\$4.00
 Shepard's Queen City.....40¢

Fry Pans—

High List.....75¢5¢75¢10¢
 No.....0 1 2 3 4
 \$ doz.....\$3.75 \$4.70 \$5.30 \$5.95 \$6.55
 No.....5 6 7 8
 \$ doz.....\$7.50 \$8.75 \$10.00 \$11.25
 Low List.....65¢10¢
 No.....0 1 2 3 4
 \$ doz.....\$3.00 \$3.75 \$4.25 \$4.75 \$5.25
 No.....5 6 7 8
 \$ doz.....\$6.00 \$7.00 \$8.00 \$9.00

Fuse—

Common Hemp Fuse, for dry ground, \$2.70
 Common Cotton Fuse, for dry ground, 2.85
 Single Taped Fuse, for wet ground.....4.25
 Double Taped Fuse, for very wet gr.....5.40
 Triple Taped Fuse, for very wet gr.....6.50
 Small Italia Percha Fuse, for water, 7.50
 Large Gutta Percha Fuse, for water, 12.00

Gauges—

Marking, Mortise, &c.....60¢10¢
 Starrett's Surface, Center and Scratch.....25¢10¢
 Wire, low list.....10¢10¢
 Wire, Wheeler, Madden & Co.....10¢
 Wire, Morse's.....50¢50¢5¢
 Wire, Brown & Sharpe's.....10¢20¢

Gimlets—

Nail and Spike.....50¢10¢5¢
 "Eureka" Gimlets.....40¢10¢
 "Diamond" Gimlets.....\$ gr \$5.00
 Double Cut, Shepard's.....45¢5¢5¢
 Double Cut, Ives.....60¢60¢5¢
 Double Cut, Douglas'.....40¢10¢
 "Bee," \$ gr \$12.....25¢25¢5¢

Glue—

Le Page's Liquid.....25¢25¢5¢
 Upton's Liquid.....35¢
 Le Page & Co.'s Improved Process.....25¢25¢5¢

Glue Pots—

Tinned.....40¢
 Enamelled.....40¢5¢
 Family, Howe's "Eureka".....40¢
 Family, L. F. C.'s "Handy".....60¢

Grindstones—

Small, at factory.....\$ ton \$7.50¢9.00

Grindstone Fixtures—

Sargent's Patent.....70¢10¢
 Reading Hardware Co.....30¢10¢

Hack Saws.—

See Saws.

Halters—

Covert's, Rope, ½-in. Jute.....50¢25¢
 Covert's, Rope, ½-in. Hemp.....40¢25¢
 Covert's Adj. Rope Halters.....40¢25¢
 Covert's Hemp Horse and Cattle Tie.....50¢25¢
 Covert's Jute Horse and Cattle Tie.....60¢10¢25¢

Hammers—

Handled Hammers—
 Maydole's, list Dec. 1, '85.....25¢25¢10¢
 Buffalo Hammer Co. (list Jan. 15, '87)
 Humason & Beckley.....50¢50¢10¢
 Atha Tool Co.....40¢10¢50¢
 Payette R. Plumb.....40¢10¢50¢
 C. Hammond & Son.....40¢10¢50¢
 Verree.....5¢
 Magnetic Tack, Nos. 1, 2, 3, \$1.25, 1.50 & 1.75.....30¢10¢
 Nelson Tool Works.....40¢10¢
 Warner & Nobles.....20¢25¢
 Peck, Stow & Wilcox.....40¢
 Sargent's.....30¢10¢
 Heavy Hammers and Sledges—
 3 lb and under.....\$ 40¢ 60¢10¢
 5 lb.....\$ 30¢ 60¢10¢
 Over 5 lb.....\$ 30¢ 60¢10¢
 Wilkinson's Smiths.....10¢5¢11¢

Handcuffs and Leg Irons—

R. I. Tool Co., Handcuffs, \$15.00 \$ doz 10¢
 R. I. Tool Co., Leg Irons, \$25.00 \$ doz 10¢
 "Tower".....25¢
 Daley's Improved Handcuffs: 3 Hands, Polished, \$ doz \$48.00; Nickleod, \$67.00; 3 Hands, Polished, \$ doz \$72.00; Nickleod, \$84.00.....25¢

Handles—

Iron, Wrought or Cast—
 Door or Thumb.....0 1 2 3 4
 Per doz.....\$0.90 1.00 1.18 1.35 1.50

60¢10¢10¢
 Roggin's Latches.....\$ doz 30¢35¢
 Bronze Iron Drop L

Cross-Cut Saw Handles—
 Atkins' No. 1 Loop, pair, 30¢; No. 3,
 22¢; No. 2 and No. 4 Reversible, 22¢.
 Boynton's Loop Saw Handles, 50¢. 60¢
 Champion.....15¢

Hangers—
 Barn Door, old patterns.....60¢10¢10¢70¢
 Barn Door, New England.....60¢10¢10¢70¢
 Samson Steel Anti-Friction.....55¢
 Orleans Steel.....55¢
 Hamilton Wrought Wood Track.....55¢
 U. S. Wood Track.....55¢
 Champion.....60¢10¢
 Rider and Wooster, Medina 7 ft. Co's
 List.....70¢
 Climax Anti-Friction.....60¢
 Climax Anti-Friction for Wood Track.....55¢
 Zenith for Wood Track.....55¢
 Reed's Steel Arm.....60¢
 Challenge, Barn Door.....60¢
 Sterling's Imp'ed (Anti-Friction) 65¢10¢
 Victor, No. 1, \$15.00; No. 2, \$16.50; No.
 3, \$18.00.....50¢10¢
 Cheritree.....50¢10¢60¢
 Kidder's.....50¢10¢60¢
 The Boss.....60¢10¢
 Best Anti-Friction.....60¢10¢
 Duplex (Wood Track).....60¢10¢5¢
 Terry's Pat., 2 doz pr. 4 in., \$10.00; 5 in.,
 \$12.00.....50¢50¢50¢10¢
 Cronk's Pat., No. 4, \$12.00; No. 5, \$14.40;
 No. 6, \$18.00.....50¢15¢60¢
 Wood Track Iron Clad, 7 ft. 10¢.....15¢60¢
 Carrier Steel Anti-Friction.....50¢50¢5¢
 Architect, set \$0.00.....20¢
 Eclipse.....20¢10¢
 Felix, set \$4.50.....20¢
 Richards.....30¢30¢10¢
 Lane's Steel Anti-Friction.....40¢10¢
 Ball Bearing Door Hanger.....20¢40¢50¢10¢
 Warner's Pat.....20¢20¢10¢
 Stearns' Anti-Friction.....20¢20¢10¢
 Stearns' Challenge.....25¢10¢25¢10¢10¢
 Faultless.....40¢40¢5¢
 American, set \$0.00.....20¢10¢
 Rider & Wooster, No. 1, 65¢; No. 2,
 75¢.....75¢
 Paragon, Nos. 1, 2 and 3.....40¢10¢
 Paragon, Nos. 5, 5½, 7 and 8.....20¢10¢
 Crescent.....60¢60¢10¢
 Nickel, Cast Iron.....60¢
 Nickel, Malleable Iron and Steel.....40¢
 Scranton Anti-Friction Single Strap.....35¢
 Scranton Anti-Friction Double Strap.....40¢
 Universal Anti-Friction.....40¢
 Wild West, 4 in. Wheel, \$15.00; 5 in.
 Wheel, \$21.00.....45¢
 Star.....40¢10¢50¢10¢
 May.....50¢50¢50¢10¢
 Barry, \$6.00.....40¢10¢

Harness Snaps—
 See Snaps.
Hatchets—
 List Jan. 1, 1888.
 Isaiah Blood.....35¢40¢
 Hunt's Shingling, Lath and Claw.....40¢5¢
 Hunt's Broad.....40¢
 Buffalo Hammer Co.....40¢10¢50¢
 Hurd's.....40¢10¢50¢
 Fayette R. Plumb.....40¢10¢50¢
 Wm. Mann, Jr., & Co.....50¢40¢50¢
 Underhill Edge Tool Co.....40¢40¢10¢
 Underhill's, Haines and Bright.....33¢4¢
 C. Hammond & Son.....40¢10¢50¢
 Simmons.....40¢10¢50¢
 Peck's.....40¢10¢40¢10¢
 Kelly's.....50¢50¢50¢
 Sargent & Co.....50¢
 Ten Eyck Edge Tool Co.....40¢10¢40¢10¢5¢
 Collins.....10¢
 Schulte, Lohoff & Co.....60¢50¢5¢

Hay and Straw Knives—
 Lightning, Mfrs' price 2 doz \$18.00, 25¢
 But jobbers frequently give extras.
 Gen.....10¢
 Wadsworth's.....40¢75¢40¢10¢
 Carter's Needle.....20¢
 Heath's.....20¢
 Auburn Hay, Com. and Spear Point.....60¢
 Auburn, Straw.....40¢
 Nollin's Hay.....20¢
Hinges—
Wrought Iron Hinges
 Strap and T.....75¢50¢75¢10¢
 Screw Hook and Strap.....34¢
 Strap.....34¢
 Heavy Welded.....34¢
 Hook.....34¢
 Screw Hook.....34¢
 Hook and Eye.....34¢
 Rolled Blind Hinges, Nos. 22 and 24.....50¢10¢
 Rolled Blind Hinges, Nos. 232 and 234.....50¢10¢
 Rolled Plate.....70¢10¢
 Rolled Raised.....70¢10¢
 Plate Hinges 8, 10 & 12 in., 5¢.....5¢
 "Providence" over 12 in., 5¢.....4¢
Spring Hinges—
 Geer's Spring and Blank Butts.....40¢
 Union Spring Hinge Co.'s List, March,
 1888.....20¢
 Acme and U. S.....20¢
 Empire and Crown.....20¢
 Hero and Monarch.....50¢
 American, Gem, and Star, Japaned.....20¢
 American, Gem, and Star, Bronzed.....20¢
 Oxford, Bronze and Brass.....20¢
 Barker's Double Acting.....20¢10¢
 Union Mfg. Co.....25¢
 Buckner's.....30¢
 Chicago.....15¢20¢
 Wilcox.....10¢
 Devore's.....40¢
 Rex.....40¢
 Royal.....60¢
 Reliable.....60¢
 Champion.....60¢
Gate Hinges—
 Western.....20¢
 N. E.....20¢
 N. E. Reversible.....20¢
 Clark's, Nos. 1, 2, 3.....20¢
 N. Y. State.....20¢
 Automatic.....20¢
 Common Sense.....20¢
 Seymour's.....20¢
 Shepard's.....20¢
 Reed's Latch and Hinges, 7 doz \$12.00,
 50¢

Blind Hinges—
 Parker.....75¢2¢
 Palmer.....50¢50¢10¢
 Seymour.....70¢2¢
 Nicholson.....45¢10¢
 Hunter.....50¢

Clark's, Nos. 1, 3, 5, 40 and 50.....75¢10¢50¢90¢
 Clark's Mortise Gravity.....50¢
 Sargent's, Nos. 1, 3, 5, 11, 13.....75¢10¢50¢10¢50¢
 Sargent's, No. 12.....77¢10¢10¢
 Reading's Gravity.....75¢10¢50¢10¢50¢
 Shepard's.....75¢10¢50¢10¢50¢
 Noiseless.....75¢10¢50¢
 Niagara.....80¢21¢
 Buffalo.....80¢5¢
 Clark's Genuine Pat.....80¢5¢
 O. S. Lull & Porter.....75¢10¢
 Acme, Lull & Porter.....75¢5¢
 Queen City Reversible.....75¢
 Clark's Lull & Porter, Nos. 0, 1, 1½,
 2, 2½, 3.....75¢10¢50¢
 North's Automatic Blind Fixtures, No.
 2, for Wood, \$10.50; No. 3, for Brick
 \$13.50.....25¢2¢

Hoes—
Handled—
 Garden, Mortar, &c.....65¢
 Planter's, Cotton, &c.....65¢
 Warren Hoe.....60¢
 Magic.....20¢
Eye—
 D. & H. Scovill.....20¢
 Lane's Crescent Planter Pattern.....45¢5¢
 Lane's Razor Blade, Scovill Pattern.....30¢
 Maynard, S. & O. Pat.....45¢5¢
 Sandusky Tool Co., S. & O. Pat.....60¢
 Hubbard & Co., S. & O. Pat.....60¢
 Chittanooga Tool Co., S. & O. Pat.....60¢
 Grub.....60¢60¢10¢

Hog Rings and Ringers—
 Hill's Improved Ringers.....20¢
 Hill's Old Style Ringers.....20¢
 Hill's Tongs.....20¢
 Hill's Rings.....20¢
 Perfect Ringers.....20¢
 Blair's Hog Ringers.....20¢
 Blair's Hog Ringers.....20¢
 Champion Ringers.....20¢
 Champion Ringers, Double.....20¢
 Brown's Ringers.....20¢
 Brown's Ringers.....20¢

Hoisting Apparatus—
 Moore's Hand Holst, with Lock.....20¢
 Moore's Differential Pulley Block.....20¢
 Energy Mfg. Co's.....25¢

Holders, File and Tool—
 Balz Pat.....20¢
 Nicholson File Holders.....20¢

Hollow-Ware—
Iron—
 Stove Hollow-Ware—
 Ground.....60¢60¢5¢
 Unground.....60¢10¢60¢10¢10¢
 Enamelled Hollow-Ware—
 Maslin Kettles.....65¢10¢
 Boilers and Saucepans.....40¢5¢
 Tinned Boilers and Saucepans.....40¢
 Gray Enamelled-Ware—
 Stove.....60¢50¢5¢
 Maslin Kettles.....60¢10¢60¢10¢10¢
 Boilers and Saucepans.....40¢5¢
 Agate and Granite Ware, old list.....25¢
 Rustless Hollow-Ware.....60¢50¢5¢
 Galvanized Tea-Kettles—
 Inch.....6 7 8 9
 Each.....55¢ 60¢ 65¢ 75¢

Silver Plated—
 4 mo. or 5¢ cash in 30 days.
 Reed & Barton.....40¢5¢
 Meriden Britannia Co.....40¢5¢
 Simpson, Hall, Miller & Co.....40¢5¢
 Rogers & Brother.....40¢5¢
 Herford Silver Plate Co.....40¢5¢
 William Rogers Mfg. Co.....40¢5¢

Hooks—
Cast Iron—
 Bird Cage, Sargent's List.....60¢10¢10¢
 Bird Cage, Reading.....60¢10¢10¢
 Clothes Line, Sargent's List.....60¢10¢10¢
 Clothes Line, Reading list.....60¢10¢10¢10¢
 Ceiling, Sargent's List.....55¢10¢10¢
 Harness, Reading list.....55¢10¢55¢10¢10¢
 Coat and Hat, Sargent's List.....50¢10¢50¢10¢
 Coat and Hat, Reading.....50¢10¢50¢10¢10¢
Wrought Iron—
 Cotton.....20¢
 Cotton Pat. (N. Y. Mallet & Handle Wks.).....30¢
 Tassel and Picture (T. & S. Mfg. Co.).....50¢
 Wrought Staples, Hooks, &c.....50¢
 See Wrought Goods.

Wire—
 Wire Coat and Hat, Gem, list April,
 1888.....45¢
 Wire Coat and Hat, Miles', list April,
 1888.....45¢
 Indestructible Coat and Hat.....45¢
 Wire Coat and Hat, Standard.....45¢
 Belt.....75¢10¢80¢

Miscellaneous—
 Grass, No. 2, \$2.00; No. 3, \$2.25; No. 4, \$2.50
 Nollin's Grass.....20¢
 Bush.....50¢
 Whiffletree-Patent.....55¢
 Hooks and Eyes-Malleable Iron.....70¢70¢10¢
 Hooks and Eyes-Brass.....60¢10¢10¢
 Fish Hooks, American.....60¢
 Bench Hooks.....See Bench Hooks.

Horse Nails—
 Nos. 6 7 8 9 10
 Ausable.....28¢20¢25¢24¢23¢
 Clinton, Fin.....24¢22¢21¢20¢19¢
 Essex.....28¢20¢25¢24¢23¢
 Lyra.....25¢23¢22¢21¢20¢
 Snowden.....25¢23¢22¢21¢20¢
 Putnam.....23¢21¢20¢19¢18¢
 Vulcan.....23¢21¢20¢19¢18¢
 Northwest.....25¢23¢22¢21¢20¢
 Globe.....23¢21¢20¢19¢18¢
 Boston.....23¢21¢20¢19¢18¢
 A. C. B.-K.....25¢23¢22¢21¢20¢
 Champlain.....28¢20¢25¢24¢23¢

New Haven.....28¢20¢25¢24¢23¢
 Saranac.....23¢21¢20¢19¢18¢
 Champion.....25¢23¢22¢21¢20¢

Capewell.....28¢20¢25¢24¢23¢
 Star.....23¢21¢20¢19¢18¢
 Anchor.....23¢21¢20¢19¢18¢
 Western.....23¢21¢20¢19¢18¢
 Empire Bronzed.....14¢
Horse Shoes—See Shoes Horse.

Hose, Rubber—
 Competition.....75¢10¢75¢10¢5¢
 Standard.....70¢70¢10¢
 Extra.....60¢60¢10¢
 N. Y. B. & P. Co., Para.....30¢10¢
 N. Y. B. & P. Co., Extra.....50¢
 N. Y. B. & P. Co., Dundee.....60¢10¢5¢

Huskers—
 Blair's Adjustable.....20¢
 Blair's Adjustable Clipper.....20¢

Indurated Fiber-Ware—
 Spittons, No. 2, 2 doz.....\$0.75
 Basins, Ringed, 2 doz, No. 1, \$3.70;
 No. 2, \$3.10; No. 3, \$2.70.....\$2.70
 Washbasins, Nested, Nos. 0, 1, 2 and 3 (4
 pieces), 2 doz, nests.....\$16.87
 Keelers, Nested, Nos. 1, 2, 3 and 4 (4
 pieces), 2 doz, nests.....\$8.37
 Butter Bowls, 15, 17 and 19-inch (3
 pieces), 2 doz, nests.....\$0.75
 Liquid Measures, pt., qt., 2 qt. and fun-
 nel (4 pieces), 2 doz.....\$3.00
 Dry Measures, 1, 2, 4, 8 and 16 qts. (5
 pieces), 2 doz.....\$2.25
 See also Pails.

Jack Screws—See Screws.

Kettles—
 Spun, Stamped.
 Brass, 7 to 17 in., 2 doz.....24¢ 21¢
 Brass larger than 17 in., 2 doz.....26¢ 23¢
 Enamelled and Tea Kettles.....See Hollow-Ware.

Keys—
 Lock Ass'n list Dec. 30, 1888.....50¢10¢
 Eagle, Cabinet, &c.....60¢5¢
 Hotchkiss' Brass Blanks.....40¢
 Hotchkiss' Copper and Tinned.....40¢
 Hotchkiss' Pad and Cab.....40¢
 Ratchet Bed Keys.....40¢
 Wollensak Tinned.....50¢10¢

Knife Sharpeners—
 Parkin's.....40¢
 Applewood Handles.....20¢
 Rosewood or Cocobolo.....20¢

Knives—
 Wilson's Butcher Knives.....25¢30¢
 Ames' Butcher Knives.....25¢
 Foster Bros' Butcher, &c.....40¢
 Nichols' Butcher Knives.....40¢10¢
 Ames' Shoe Knives.....20¢25¢
 Ames' Shoe and Bread.....20¢
 Hay and Straw.....See Hay Knives.
 Table and Pocket.....See Cutlery.
 Corn, Auburn Mfg. Co. Western Pat.....20¢
 Corn, Auburn Mfg. Co. Crescent.....\$3.50

Knobs—
 Door Mineral.....65¢68¢
 Door Por. Jap'd.....75¢78¢
 Door Por. Nickel.....\$2.00\$2.25
 Door Por. Plated, Nickel.....\$2.00\$2.25
 Drawer, Porcelain.....60¢10¢60¢10¢10¢
 Henckels Door Knobs.....40¢10¢50¢
 Yale & Towne Wood, list Dec., 1885.....40¢
 Furniture Plain.....75¢gro inch, 10¢
 Furniture, Wood Screws.....25¢10¢
 Base, Rubber Tip.....70¢10¢5¢
 Picture, Judd's.....60¢10¢10¢70¢
 Picture, Sargent's.....70¢10¢
 Picture, Hematite.....35¢5¢
 Shutter, Porcelain.....65¢10¢
 Carriage, Jap.....20¢gro 80¢, 60¢10¢

Ladies—
 L. M. Sargent's.....55¢10¢
 Melting, Reading.....35¢10¢
 Melting, Monroe's Pat.....20¢40¢, 40¢
 Melting, F. S. & W.....35¢10¢40¢
 Melting, Warner's.....30¢

Lawn Mowers—
 Standard List.....50¢10¢
 Quaker City.....60¢10¢
 Enterprise.....60¢10¢

Lanterns—
Tubular—
 Plain with Guards, 2 doz.....\$4.00\$4.25
 Lift Wire, with Guards.....\$4.50\$4.75
 Square Plain, with Guards.....\$4.00\$4.25
 Sq. Lift Wire, with Guards.....\$4.25\$4.50
 Without Guards, 25¢ doz less.
Miscellaneous—
 Police, Small, \$6.00; Medium, \$7.25;
 Large, \$9.75.....20¢25¢

Lemon Squeezers—
 Porcelain Lined, No. 1.....20¢
 Wood, No. 2.....25¢30¢
 Wm. Combs' Lemon Squeezer, 84 ft., No. 1
 \$1.25; No. 2, \$1.75; No. 3, \$2.25; No. 4,
 \$2.75; No. 5, \$3.25.....25¢
 Cotton Chalk.....55¢
 Samson, Cotton, No. 4, \$2; No. 4½, \$2.50;
 No. 5, \$3.....10¢
 Silver Lake, Braided, No. 0, \$6.00; No.
 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50;
 No. 4, \$8.00.....25¢
 Mason's Linen, No. 3½, \$1.50; No. 4,
 \$2.00; No. 4½, \$2.50.....45¢
 Mason's Colored Cotton.....45¢
 Wire Clothes.....15¢ 30¢
 \$3.00 \$3.00 \$2.50

Lines—
 Cotton and Linen Fish, Draper's.....50¢
 Draper's Chalk.....80¢
 Draper's Mason's Linen, 84 ft., No. 1
 \$1.25; No. 2, \$1.75; No. 3, \$2.25; No. 4,
 \$2.75; No. 5, \$3.25.....25¢
 Cotton Chalk.....55¢
 Samson, Cotton, No. 4, \$2; No. 4½, \$2.50;
 No. 5, \$3.....10¢
 Silver Lake, Braided, No. 0, \$6.00; No.
 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50;
 No. 4, \$8.00.....25¢
 Mason's Linen, No. 3½, \$1.50; No. 4,
 \$2.00; No. 4½, \$2.50.....45¢
 Mason's Colored Cotton.....45¢
 Wire Clothes.....15¢ 30¢
 \$3.00 \$3.00 \$2.50

Ventilator Cord, Samson Braided,
 White or Drab Cotton.....20¢

Locks, &c.—
 Door Locks, Latches, &c.
 List Dec. 30, 1888, chgd Feb. 2, '89.....50¢10¢60¢10¢

Mallory, Wheeler & Co., list July, '88
 Sargent & Co., list Aug. 1, '88.....55¢2¢
 Reading Hardware Co., list Feb. 2, '88.....55¢60¢10¢

Note—Lower net prices often made.
 Perkins' Burglar Proof.....60¢25¢
 Plate.....35¢25¢
 F. Many's "Extension Cylinder" \$10.50
 2 doz

Barnes Mfg. Co.....40¢40¢10¢
 Yale.....net prices
 Deltz Flat Key.....30¢
 L. & C. Round Key Latches.....30¢10¢
 L. & C. Flat Key Latches.....35¢10¢
 Romer's Night Latches.....15¢
 Shephardson or U. S.....35¢
 Felter or American.....40¢10¢
 Seed's N. Y. Hasp Lock.....25¢

Cabinet—
 Eagle, Gaylord Par / list March, '84, rev.
 ker and Corbin.....Jan. 1, '85, 33¢22¢
 Deltz, Nos. 30 to 33.....40¢
 Deltz, Nos. 51 to 53.....40¢10¢
 Deltz, Nos. 86 to 90.....30¢
 Stoddard Lock Co.....30¢33¢4¢
 "Champion" Night Latches.....40¢
 Barnes Mfg. Co.....40¢40¢10¢
 Eagle and Corbin Trunk.....25¢25¢
 "Champion" Cab. and Combln.....33¢4¢
 Yale.....net prices
 Romer's.....25¢

Padlocks—
 List Dec. 23, '84.....75¢75¢10¢
 Yale Lock Mfg. Co.'s.....net prices
 Eagle.....25¢2¢
 Eureka, Eagle Lock Co.....40¢25¢
 Romer's, Nos. 0 to 91.....10¢
 Romer's Scandinavian, &c., Nos. 100 to
 505.....15¢
 A. E. Deltz.....40¢
 Champion Padlocks.....40¢
 Hotchkiss.....30¢
 Star.....20¢
 Horseshoe.....20¢
 Barnes Mfg. Co.....40¢40¢10¢
 Brock's.....30¢
 Brock's Pat.....25¢
 Scandinavian.....30¢40¢10¢
 Fram's Pat. Scandinavian low list.....60¢
 Ames Sword Co. up to No. 150.....40¢
 Ames Sword Co. above No. 150.....50¢

Lumber Tools—
 Ring Peavies, "Blue Line".....20¢
 Ring Peavies, Common.....20¢
 Steel Socket Peavies.....20¢
 Mail, Iron Socket Peavies.....20¢
 Cant Hooks, "Blue Line".....20¢
 Cant Hooks, Common Finish.....20¢
 Cant Hooks, Mail, Socket Clasp, "Blue
 Line" Finish.....20¢
 Cant Hooks, Mail, Socket Clasp, Com-
 mon Finish.....20¢
 Cant Hooks, Clip Clasp, "Blue Line"
 Finish.....20¢
 Cant Hooks, Clip Clasp, Common Fin-
 ish.....20¢
 Hand Spikes.....20¢

Pike Poles, Pike and Hook, 2 doz., 12 ft.,
 \$11.50; 14 ft., \$12.50; 16 ft., \$14.50;
 18 ft., \$17.50; 20 ft., \$21.50.....20¢
 Pike Poles, Pike only, 2 doz., 12 ft.,
 \$10.00; 14 ft., \$11.00; 16 ft., \$13.00; 18
 ft., \$16.00; 20 ft., \$20.00.....20¢
 Pike Poles, not ironed, 2 doz., 12 ft.,
 \$6.00; 14 ft., \$7.00; 16 ft., \$9.00; 18
 ft., \$12.00; 20 ft., \$16.00.....20¢
 Setting Poles, 2 doz., 12 ft., \$14.00; 14
 ft., \$15.00; 16 ft., \$17.00.....20¢
 Swamp Hooks.....20¢

Lustro—
 Four-ounce Bottles.....20¢
 gross.....\$1.75; 20 gross.....\$17.00

Mallets—
 Hickory.....20¢10¢20¢10¢10¢
 Lignumvite.....20¢10¢20¢10¢10¢
 B. & L. Block Co., Hickory & L. V.....30¢30¢10¢

Match Safes—
 Dangerfield's Self-Igniting.....20¢
 Mattocks, Regular list.....60¢5¢60¢10¢

Meat Cutters—
 Dixon's 2 doz.....40¢5¢
 Nos.....1 2 3 4
 \$14.00 \$17.00 \$19.00 \$30.00
 Woodruff's 2 doz.....40¢5¢
 Nos.....100 150
 \$15.00 \$18.00

Champion 2 doz.....40¢45¢
 Nos.....200 300 400
 \$22.00 \$27.00 \$40.00
 Hales Pattern 2 doz.....70¢70¢5¢
 Nos.....11 12 13
 \$27.00 \$33.00 \$45.00
 American.....1 2 3 4 B 5
 Each.....\$5 \$7 \$10 \$25 \$50 \$80
 Enterprise.....30¢
 Nos.....10 12 32 42
 Each.....\$3 \$2.50 \$4 \$6 \$15
 Pennsylvania.....1 2 3 4
 Nos.....1 2 3 4
 2 doz.....\$24.00 \$28.00 \$36.00 \$28.00
 Miles' Challenge 2 doz.....45¢45¢10¢
 Nos.....1 2 3
 \$22.00 \$30.00 \$40.00

Home No. 1.....20¢
 Draw Cut, each.....20¢
 Nos.....5 6 8
 \$50 \$75 \$80 \$225.....20¢25¢
 Beef Shavers (Enterprise).....20¢10¢30¢
 Chadborn's Smoked Beef Cutter.....20¢
 \$66.00

Mincing Knives—
 Am. (2d quality), 2 gr., 1 blade, \$7; 2
 blades, \$12; 3 blades, \$18.....net
 Lothrop's.....20¢10¢
 Smith's, 2 doz, Single, \$2.00; Double, \$3
 40¢45¢
 Knapp & Cowles.....50¢10¢60¢
 Buffalo Adjustable.....20¢ doz, \$3.00, 25¢

Molasses Gates—

Stebbin's Pat.	70¢@70¢7½¢
Stebbin's Genuine	60¢@10¢10¢
Stebbin's Tinned Ends	40¢@10¢
Chase's Hard Metal	50¢@10¢
Bush's	20¢
Lincoln's Pattern	70¢@70¢10¢
Woods	20¢@10¢

Money Drawers—

Nos. 1, 87; No. 2, 88; No. 3, 89; No. 4, 90	10¢
10¢	60¢@10¢10¢

Muzzles—

Safety	10¢ doz, \$3.00, 25¢
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Nails, see Trade Report.

Wire Nails & Brads, list July 14, '87	70¢@10¢
Wire Nails, Standard Penny	10¢ doz, \$2.50@2.60

Nail Puller—

Curtiss Hammer	10¢ doz \$9.00
Glant, No. 1	10¢ doz \$30.00, 10¢
Pelican	10¢ doz, \$9.00, 25¢
Boss	10¢ doz, \$30.00, 30¢
Lightning	10¢ doz \$21.00

Nail Sets—

Square	10¢ gr, \$4.00@4.25
Round	10¢ gr, \$3.25
Cannon's Diamond Point	10¢ gr, \$12, 20¢

Nut Crackers—

Table (H. & B. Mfg. Co.)	40¢
Blake's Pattern	10¢ doz \$2.00, 10¢
Turner & Seymour Mfg. Co.	50¢

Nuts—

Nuts, off list Jan. 1, 1888: Square, Hex.	5.4¢ 5.9¢
Hot Pressed	5.4¢ 5.9¢
Cold Punched	5.4¢ 5.9¢
In lots less than 100 lb, add 1/4¢; 1-lb boxes, add 1¢ to list.	

Oakum—

Government	10¢ 7½¢ @ 8¢
U. S. Navy	10¢ 6½¢ @ 7¢
Navy	10¢ 5½¢ @ 6½¢

Oilers—

Zinc and Tin	65¢@65¢10¢
Brass and Copper	65¢@10¢50¢10¢55¢
Malleable, Hammers Improved, No. 1, \$3.00; No. 2, \$4.00; No. 3, \$4.40	10¢ doz.
Malleable, Hammers, Old Pattern, same list	40¢
Prior's Pat. or "Paragon" Zinc	60¢@10¢10¢
Prior's Pat. or "Paragon" Brass	50¢
Olmead's Tin and Zinc	60¢
Olmead's Brass and Copper	50¢
Broughton's Zinc	60¢
Broughton's Brass	50¢

Packing, Steam—

Rubber—	
Standard	60¢@10¢60¢10¢10¢
Extra	50¢@10¢60¢
N. Y. B. & P. Co., Standard	50¢@10¢55¢
N. Y. B. & P. Co., Empire	70¢
N. Y. B. & P. Co., Salamander	10¢ 65¢, 30¢
Jenkins' Standard	10¢ 80¢, 35¢

Miscellaneous—

American Packing	10¢@11¢ 10¢
Russia Packing	14¢ 10¢
Italian Packing	13¢@14¢ 10¢
Cotton Packing	15¢@17¢ 10¢
Jute	7¢@8¢ 10¢

Padlocks—

See Locks.	
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Pails—

Galvanized Iron—	
Quarts	10 12 14
Hill's Light Weight	10 doz \$2.75 3.00 3.25
Hill's Heavy Weight	10 doz 3.00 3.25 3.75
Whitins	2.75 3.00 3.25
Sidney Shephard & Co.	2.80 3.00 3.40
Iron Clad	2.75 3.00 3.25
Fire Buckets	2.75 3.25 3.50
Buckets, see Well Buckets.	

Indurated Fibre Ware—

Star Pails, 12 qt	10¢ doz \$4.50
Fire, Stable and Milk, 14 qt	10¢ doz \$5.85

Pencils—

Faber's Carpenters	high list 50¢
Faber's Round Gilt	10¢ gro \$5.25
Dixon's Lead	10¢ gro \$4.50
Dixon's Lumbar	10¢ gro \$6.75
Dixon's Carpenters	40¢@10¢

Picks—

Railroad or Adze Eye, 5 to 6, \$12.00; 6 to 7, \$13.00	60¢@50¢10¢10¢
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Picture Nails—

Brass Head, Sargent's list	50¢@10¢10¢
Brass Head, Combination list	50¢@10¢
Porcelain Head, Sargent's list	50¢@10¢10¢
Porcelain Head, Combination list	40¢@10¢
Niles' Patent	40¢

Pinking Irons—

10¢ doz 65¢ net	
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Pipe, Wrought Iron—

List March 23, 1887.	
1½ and under, Plain	55¢
1½ and under, Galvanized	67¢
1½ and over, Plain	67¢
1½ and over, Galvanized	55¢
Boiler Tubes, Iron.	
1½ and under	57½¢
2 in. to 2½ in.	62½¢
3 in. and larger	65¢

Planes and Plane Irons—

Wood Planes—	
Molding	50¢@50¢50¢10¢
Scarf, First Quality	60¢@60¢55¢
Bench, Second Quality	60¢@10¢60¢10¢10¢
Bailey's (Stanley R. & L. Co.)	40¢@10¢

Iron Planes—

Bailey's (Stanley R. & L. Co.)	40¢@10¢
Miscellaneous Planes (Stanley R. & L. Co.)	30¢@10¢
Victor Planes (Stanley R. & L. Co.)	30¢@10¢
Steel's Iron Planes	35¢@35¢55¢
Meriden Mfg. Co.'s	30¢@10¢30¢10¢10¢
Davis's Iron Planes	30¢@10¢30¢10¢10¢
Birmingham Plane Co.	50¢@50¢55¢
Gage Tool Co.'s Self-Setting	20¢@10¢
Chaplin's Iron Planes	40¢@40¢55¢
Sargent's	30¢@10¢30¢10¢10¢

Plane Irons—

Plane Irons, Butcher's	20¢@10¢
Plane Irons, Buck Bros	30¢
Plane Irons, Auburn Tool Co., "This-It"	40¢
Sandusky Tool Co.	30¢
Double and Cut	40¢
L. & J. White	25¢

Pliers and Nippers—

Button's Patent	30¢@10¢40¢
Hall's No. 2, 5 in.	\$13.50; No. 4, 7 in.
\$21.00 doz	20¢@10¢33½¢
Humason & Beckley Mfg. Co.	50¢@50¢10¢
Gas Pliers	60¢
Gas Pliers, Custer's Nickel Plated	60¢55¢
Eureka Pliers and Nippers	40¢
Russell's Parallel	25¢
P. S. & W. Cast Steel	50¢
P. S. & W. Tanners' Cutting Nippers	add 6¢ dis 10¢
Carew's Pat. Wire Cutters	30¢
Morrill's Parallel	10¢ doz \$12.00
Cronk's 8 in., 15 in.; 10 in.	\$21.00
40¢@40¢55¢	

Plumbs and Levels—

Regular List	70¢@10¢70¢10¢10¢
Disston's	45¢@10¢
Pocket Levels	70¢@10¢70¢10¢10¢
Davis' Iron Levels	30¢
Davis' Inclometers	10¢@10¢

Polish Metal.

Prestoline	20¢@10¢
Krestoline Paste	33½¢
Gaston's Silver Compound	33½¢

Pokes, Animal—

Bishop's I. X. L.	10¢ doz \$8.50
Bishop's O. K.	10¢ doz \$5.50
Bishop's Pioneer	10¢ doz \$3.75
Bishop's American	10¢ doz \$3.00

Poppers, Corn—

Round or Square, 1 qt.	10¢ gr \$12.00@15.00
Round or Square, 2 qt.	10¢ gr \$25.00@26.00

Post Hole and Tree Augers and Diggers—

Samson Post Hole Digger	10¢ doz \$36.00
Fletcher Post Hole Augers	10¢ doz \$36, 20¢
Eureka Diggers	10¢ doz \$16.00@17.00
Leed's	10¢ doz \$8.00@9.00
Vaughan's Post Hole Auger	10¢ \$13.00@14.00
Kohler's Little Giant	10¢ doz \$18.00
Kohler's Hercules	10¢ doz \$15.00
Kohler's New Champion	10¢ doz \$9.00
Schneider	10¢ doz \$18.00
Ryan's Post Hole Diggers	10¢ doz \$24.00
Cronk's Post Bars	10¢ doz \$60.00
Gibbs Post Hole Digger	10¢ doz \$30.00, 50¢
Imperial	10¢ doz \$15.00

Potato Parers—

White Mountain	10¢ doz \$5.00@5.50
Antrim Combination	10¢ doz \$8.00
Hosier	10¢ doz \$13.50

Pruning Hooks and Shears—

Disston's Combined Pruning Hook and Saw	10¢ doz \$18.00, 20¢@10¢
Disston's Pruning Hook	10¢ doz \$18.00
E. S. Lee & Co.'s Pruning Tools	40¢
Pruning Shears, Henry's Pat.	10¢ doz \$3.75@4.00 net
Henry's Pruning Shears	10¢ doz \$4.25@4.50 net
Wheeler, M. & C. Co.'s Combination	10¢ doz \$12.00, 20¢
Dunlap's Saw and Chisel	10¢ doz \$8.50, 30¢
J. Mallinson & Co., No. 1, \$5.25; No. 2, 7.25	

Pulleys—

Hot House, Awning, &c.	60¢@10¢
Jannaped Screw	60¢@10¢
Brass Screw	60¢@10¢
Jannaped Side	60¢@10¢
Jannaped Clothes Line	60¢@10¢
Empire Sash Pulley	55¢@60¢
Moore's Sash, Anti-Friction	50¢
Hay Fork, Solid Eye, \$4.00; Swivel, \$4.50	50¢@10¢50¢10¢55¢
Hay Fork, "Anti-Friction," 5 in. Solid, \$5.70	50¢
Hay Fork, "Common and Pat.	50¢
Hay Fork, Tarbox Pat. Iron	20¢
Hay Fork, Reed's Self-Lubricating	60¢
Shade Rack	45¢
Tackle Blocks	See Blocks
Moore's Anti-Friction 5 in. Wheel	40¢

Pumps—

Cistern, Best Makers	50¢@10¢60¢
Pitcher Spout, Best Makers	60¢@10¢60¢
Pitcher Spout, Cheaper Goods	40¢@10¢70¢55¢

Punches—

Saddlers' or Drive, good	10¢ doz \$6.00@6.5¢
Bemis & Call Co.'s Cast Steel Drive	50¢55¢
Bemis & Call Co.'s Springfield Socket	50¢55¢
Spring, good quality	10¢ doz \$2.50@2.60
Spring, Leach's Pat.	15¢
Bemis & Call Co.'s Spring and Check	40¢
Solid Tanners	10¢ doz \$1.44, 55¢
Tanners' Hollow Punches	30¢25¢
Rice Hand Punches	15¢
Avery's Revolving	30¢@10¢
Avery's Saw-Set and Punch. See Saw Sets.	

Rail—

Sliding Door, Wrt Brass	10¢ 35¢
Sliding Door, Bronzed Wrt Iron	10¢ 7¢
Sliding Door, Iron, Painted	10¢ 4¢, 40¢
Barn Door, Light, In.	10¢ 3¢, 4¢
Per 100 feet	\$2.00 2.50 3.10, 10¢
B. D. for N. E. Hinges	Small. Med. Large.
Terry's Wrought Iron	10¢ foot .44¢
Victor Track Rail	7¢ foot .50¢25¢
Carrier Steel Rail	10¢ foot .45¢
Moore's Wrought Iron	25¢

Rakes—

Cast Steel, Association goods	65¢
Cast Steel, outside goods	60¢@10¢70¢
Malleable	70¢@70¢55¢
Gibbs Lawn Rake	\$12.00, 50¢10¢
Canton Lawn Rake	\$9.00, 50¢10¢
Pt. Madison Prize Bow Brace and Peerless	65¢
Fort Madison Steel Tooth Lawn Rake	\$6.00

Razors—

J. R. Torrey Razor Co.	20¢
Wootenholme and Butcher, \$10.00 to 2	10¢

Razor Straps—

Genuine Emerson	60¢@60¢55¢
Imitation	10¢ doz \$2.00, 20¢@10¢55¢
Torrey's	20¢
Badger's Belt and Com.	10¢ doz \$2.00
Lamont Combination	10¢ doz \$4.00

Rivets and Burrs—

Copper	50¢
Iron, list Nov. 17, '87	50¢

Rivet Sets.

50¢@10¢	
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Rods—

Stair, Brass	25¢2¢
Stair, Black Walnut	10¢ doz 40¢

Rollers—

Barn Door, Sargent's list	60¢@10¢10¢
Acme Moore's Anti-Friction	55¢
Union Barn Door Roller	70¢

Rope—

Manufacturers' prices for large lots:	
Manila, ½ in. and larger	15¢4¢
Manila, ¾ in.	16¢4¢
Manila, 1 in. and 1½ in.	16¢4¢
Manila Tarred Rope	15¢4¢
Manila, Hay Rope	15¢4¢
Sisal, ½ inch and larger	12¢4¢
Sisal, ¾ in.	13¢4¢
Sisal, 1 in. and 1½ in.	13¢4¢
Sisal, Tarred Rope	12¢4¢
Sisal, Medium Lathe Yarn	11¢4¢
Cotton Rope	15¢18¢ net
Jute Rope	8¢

Rules—

Boxwood	80¢@10¢80¢10¢10¢
Wry	50¢@50¢10¢
Sharrett's Rules and Straight Edges	25¢@10¢

Sad Irons—

From 4 to 10, at factory	100¢
Self-Heating	10¢ doz \$2.40@2.55
Self-Heating, Tailors	10¢ doz \$9.00 net
Glenn's Shield and Toilet	10¢ doz \$18.00 net
Mrs. Pott's Irons	40¢@40¢10¢
Enterprise Star Irons	40¢
Combined Fluter and Sad Iron	10¢ doz.
15¢	
Reversible, Self-Fluter	10¢ doz \$24.00
Chinese Laundry (N. E. Butt Co.)	8½¢, 15¢
New England	15¢
Mahony's Troy Irons	25¢
Sensible	20¢@20¢55¢
National Self-Heating	30¢

Sand and Emery Paper and Cloth—

List April 10, 1886	40¢@10¢50¢
Sibley's Emery and Crocus Cloth	30¢

Sash Cord—

Common	10¢ 10¢@11¢
Patent, good quality	10¢ 13¢@13½¢
White Cotton Braided, fair	10¢ 25¢20¢
Common Russia Sash	10¢ 13½¢
Patent	10¢ 15¢
Cable Laid Italian Sash	10¢ 22¢@23¢
India Cable Laid	10¢ 13¢

Silver Lake—

A Quality, White	50¢ 10¢@10¢55¢
B Quality, White	50¢ 10¢@10¢55¢
B Quality, Drab	50¢ 10¢@10¢55¢
C Quality, White (only)	20¢ 10¢@25¢
Sylvan Spring, Extra Braided, White	34¢
Sylvan Spring, Extra Braided, Drab	30¢
Semper India, Braided, White	30¢
Egyptian, India Hemp, Braided	25¢

Sash Locks—

Clark's, No. 1, \$10; No. 2, 88¢ gr.	33½¢
Ferguson's	33½¢
Morris and Triumph, list Aug. 16, 1886	33½¢
Victor	60¢@10¢25¢
Walker's	10¢
Attwell Mfg. Co.	25¢33½¢
Reading	60¢@10¢60¢10¢10¢
Common Sense, Jap'd, Cop'd and Br'd	10¢ 40¢
Common Sense, Nickel Plated	10¢ gr \$4.00

Sash Weights—

Victor.....	60¢&10&2%
Walker's.....	10%
Attwell Mfg. Co.....	25&33½%
Reading.....	66½&10@66½&10&10%

Machine—	
Flat Head, Iron.....	55¢
Round Head, Iron.....	50¢
Bench and Hand—	
Bench, Iron.....	55¢10¢55¢10¢10¢
Bench, Wood, Beech.....	50¢25¢
Bench, Wood, Hickory.....	20¢10¢
Hand, Wood.....	25¢10¢25¢10¢5¢
Lag, Blunt Point.....	75¢75¢10¢
Coach and Lag, Gimlet Point.....	75¢
Bed.....	25¢5¢
Hand Rail, Sargent's.....	60¢10¢
Hand Rail, H. & B. Mfg. Co.....	70¢10¢75¢
Hand Rail, Am. Screw Co.....	75¢
Jack Screws, Millers Falls list.....	50¢50¢25¢
Jack Screws, P. S. & W.....	35¢
Jack Screws, Sargent.....	60¢10¢60¢10¢5¢
Jack Screws, Stearns.....	40¢40¢10¢

Scroll Saws—	
Lester, complete, \$10.00.....	25¢
Rogers, complete, \$4.00.....	25¢
Barnes' Builders' and Cabinet Makers.....	\$15.
Barnes' Scroll Saw Blades.....	35¢

Scythe Snaths—	
American (Cast) Iron.....	75¢10¢75¢10¢5¢
Pruning..... See Pruning Hooks and Shears.	
Barnard's Lamp Trimmers.....	50¢ doz \$3.75
Timmers.....	20¢2¢
Seymour's, List, Dec. 1881.....	60¢10¢10¢60¢10¢10¢5¢

Shears—	
Heinrich's, List, Dec. 1881.....	60¢10¢10¢60¢10¢10¢5¢
Heinrich's Tailor's Shears.....	33¢4¢
First quality C. S. Trimmers.....	80¢80¢10¢
Second quality C. S. Trimmers.....	60¢10¢80¢10¢10¢
Acme Cast Shears.....	10¢10¢
Diamond Cast Shears.....	10¢
Clipper.....	10¢10¢
Victor Cast Shears.....	75¢10¢75¢10¢5¢
Howe Bros. & Hulbert, Solid Forged Steel.....	40¢
Chicago Drop Forge & F. Co., Solid Steel Forged.....	60¢
Clauss Shear Co., Japanned.....	70¢
Clauss Shear Co., Nickeled, same list.....	60¢

Sheaves—	
Sliding Door—	
M. W. Co., list July, 1888.....	50¢10¢60¢5¢
R. & E., list Dec. 18, 1885.....	55¢20¢
Corbin's list.....	60¢10¢25¢
Patent Roller.....	60¢10¢25¢
Patent Roller, Hatfield's.....	75¢
Russell's Anti-Friction, list Dec. 18, 1885.....	60¢2¢
Moore's Anti-Friction.....	50¢
Sliding Shutters—	
R. & E., list Dec. 18, 1885.....	60¢10¢2¢
Sargent's list.....	60¢10¢
Reading list.....	60¢10¢10¢

Ship Tools—	
L. & I. J. White.....	20¢5¢
Albertson Mfg. Co.....	25¢

Shoes, Horse, Mule, &c.—	
Horse—	
Burden's, Perkins', Phoenix, at factory.....	\$4.00
Mule—	
Add \$1 per keg to above prices.	

Ox, Wrought—	
Ton lots.....	50¢ 9¢
1000 lb lots.....	50¢ 9¢
500 lb lots.....	50¢ 10¢

Shot—	
(Eastern prices 2¢ off, cash, 5 days.)	
Drop, 5 bag, 25 lb.....	\$1.10
Drop, 5 bag, 5 lb.....	29¢
Buck and Chilled, 5 bag.....	1.41
Buck and Chilled, 5 lb bag.....	.34

Shovels and Spades—	
Ames' Shovels, Spades, &c., list Nov. 1, 1885.....	20¢
NOTE.—Jobbers frequently give 5¢ to 7½¢ extra on above.	
Griffith's Black Iron.....	50¢10¢
Griffith's C. S.....	60¢10¢10¢
Griffith's Solid C. S. R. B. Goods.....	20¢
Old Colony (Sanford Fork & Tool Co.).....	20¢
St. Louis Shovel Co.....	20¢20¢75¢
Hussey, Binns & Co.....	15¢25¢
Hussey & Co.....	20¢20¢75¢
Lehigh Mfg. Co.....	50¢10¢
Payne Petroleum & Son, list January, 1886.....	30¢
Remington's (Lowman's) Pat.....	30¢10¢40¢
Rowland's, Black Iron.....	50¢10¢
Rowland's Steel.....	60¢5¢60¢10¢

Shovels and Tongues—	
Iron Head.....	60¢10¢60¢10¢5¢
Brass Head.....	90¢10¢10¢

Skins, Thimble—	
Western list.....	75¢5¢75¢10¢
Columbus Wrt. Steel, list Nov. 1, 1887.....	20¢
Coldbrookdale Iron Co.....	50¢10¢
Utica P. S. T. Skins.....	60¢
Utica Turned and Fitted.....	35¢

Sieves—	
Buffalo Metallic, S. S. & Co.....	50¢25¢10¢
Barley Flour Sifters.....	50¢ doz \$2.00
Electric.....	50¢ doz \$18.00
Hunter's.....	50¢ doz \$21.00
Smith's Adjustable Sifters.....	50¢ doz \$2.00
Smith's Adjustable Milk Strainer.....	50¢ doz \$2.00
Smith's Adjustable T. & C. Strainer.....	50¢ doz \$1.25

Sieves, Wooden Rim—	
Metal.....	70¢ 90¢
Mesh 20, Nested, 5 doz.....	85¢ \$1.00
Mesh 24, Nested, 5 doz.....	\$1.00 1.10

Slates—	
School, by case.....	40¢

Snaps, Harness, &c.—	
Anchor (T. & S. Mfg. Co.).....	65¢
Fitch's (Bristol).....	50¢10¢
Hotchkiss.....	10¢
Andrews.....	50¢
Sargent's Patent Guarded.....	70¢10¢10¢
German, new list.....	40¢10¢
Covert.....	50¢2¢
Covert, New Patent.....	50¢2¢
Covert, New R. E.....	60¢2¢
Covert Spring.....	60¢10¢10¢

Soldering Irons—	
Covert's Adjustable, list Jan. 1, 1886.....	35¢25¢

Spoke Shaves—	
Iron.....	45¢
Wood.....	30¢
Bailey's (Stanley R. & L. Co.).....	40¢10¢
Stearns.....	20¢10¢30¢

Spoke Trimmers—	
Bonney's.....	50¢ doz \$10.00, 50¢
Stearns.....	20¢10¢
Ives', No. 1, \$15.00; No. 2, \$12.00.....	50¢ doz
Douglas.....	50¢ doz \$9.00, 20¢

Spoons and Forks—	
Tinned Iron—	
Basting, Cen. Stamp, Co's list.....	70¢10¢
Solid Table and Tea, Cen. Stamp, Co's list.....	70¢10¢
Buffalo S. S. & Co.....	33¢4¢
Silver-Plated— (4 mos. or 5¢ cash 30 days)	
Meriden Brit. Co., Rogers.....	50¢
C. Rogers & Bros.....	50¢
Rogers & Bro.....	50¢
Reed & Barton.....	50¢
Wm. Rogers Mfg. Co.....	50¢10¢60¢
Simpson, Hall, Miller & Co.....	50¢10¢
Holmes & Edwards Silver Co.....	50¢10¢
No. 67 Mexican Silver.....	50¢10¢
No. 30 Silver Metal.....	50¢10¢
No. 24 German Silver.....	50¢10¢
No. 50 Nickel Silver.....	50¢10¢
No. 49 Nickel Silver.....	50¢10¢
German Silver.....	50¢10¢5¢
German Silver, Hall & Elton.....	50¢5¢ cash
Nickel Silver.....	50¢5¢50¢10¢5¢ cash
Britannia.....	90¢
Boardman's Nickel Silver.....	50¢
Boardman's Britannia Spoons, case lots.....	60¢

Springs—	
Elliptic, Concord, Platform and Half Scroll.....	60¢60¢5¢
Cliff's Bolster Springs.....	25¢
Squares—	
Steel and Iron.....	75¢10¢80¢
Nickel-Plated.....	75¢10¢80¢
Try Square and T Bevels.....	60¢10¢60¢10¢
Disston's Try Square and T Bevels.....	45¢10¢
Winterbottom's Try and Miter.....	30¢10¢
Starrett's Micrometer Caliper Squares.....	25¢
Avery's Flush Bevel Squares.....	30¢5¢

Staples—	
Fence Staples, Galvanized.....	Same price as B. & W. Wire
Fence Staples, Plain.....	See Trd. Rep.

Steelyards—	
Blacksmith's.....	40¢10¢50¢

Stocks and Dies—	
Blacksmith's.....	30¢5¢30¢10¢
Waterford Goods.....	30¢5¢30¢10¢
Butterfield's Goods.....	30¢5¢30¢10¢
Lightning Screw Plate.....	25¢30¢
Reece's New Screw Plates.....	33¢4¢5¢40¢

Stone—	
Hindustan No. 1, 3¢; Axe, 3¢4¢; Slips No. 1, 4¢4¢	
Sand Stone.....	21¢
Washita Stone, Extra.....	19¢20¢
Washita Stone, No. 1.....	14¢15¢
Washita Stone, No. 2.....	10¢11¢
Washita Slips, No. 1, Extra.....	30¢38¢
Washita Slips, No. 1.....	24¢25¢
Arkansas Stone, No. 1, 4 to 6 in.....	\$1.50
Arkansas Stone, No. 1, 6 to 9 in.....	\$1.85
Turkey Oil Stone, 4 to 8 in.....	40¢
Turkey Slips.....	\$1.00 to \$1.50
Lake Superior, Chase.....	16¢
Black Eagle Superior Slips, Chase.....	30¢32¢
Seneca Stone, Red Paper Brand.....	18¢20¢
Seneca Stone, High Rounds.....	20¢25¢
Seneca Stone, Small Whets.....	20¢24¢

Stove Polish—	
Joseph Dixon's.....	50¢ doz \$6.00, 10¢
Gem.....	50¢ doz \$4.50, 10¢
Gold Medal.....	50¢ doz \$6.00, 25¢
Mirror.....	50¢ doz \$6.00, 10¢
Lustro.....	50¢ doz \$4.75, 10¢
Ruby.....	50¢ doz \$3.75, 10¢
Rising Sun, 5 gro lots.....	50¢ doz \$5.50, 10¢
Dixon's Plumbago.....	50¢ doz \$5.00, 10¢
Boynton's Noon Day.....	50¢ doz \$13.00, 10¢
Parlor Pride Stove Enamel.....	50¢ doz \$8.00, 10¢
Yates' Liquid, 2 3 5 10 gal.....	\$4.00
Yates' Liquid, 2 3 5 10 gal.....	\$4.00
Yates Standard Paste Polish, 10 lb cans.....	12¢
Jet Black.....	50¢ doz \$3.50, 10¢
Japanes.....	50¢ doz \$3.50, 10¢
Freiside.....	50¢ doz \$2.50, 10¢
Diamond O. K. Enamel.....	50¢ doz \$1.00, 10¢
Bonnett's Liquid Stove Polish.....	50¢ doz \$9.00, 10¢
Bonnett's Paste Stove Polish.....	50¢ doz \$6.00, 10¢
Parlor Pride Stove Enamel, 5 and 10 lb cans.....	12¢
Black Jack Water Paste, 5 and 10 lb cans.....	12¢
Nickel Plate Paste.....	50¢ doz \$6.00, 10¢

Tacks, Brads, &c.—	
(List, Jan. 2, 1888.—Note.—Some manufacturers are selling Tacks at slightly higher prices than those named.)	
American Iron Carpet.....	80¢80¢5¢
Steel Carpet.....	80¢80¢5¢
Swedes Iron Carpet.....	80¢80¢5¢
American Iron Cut.....	75¢75¢10¢
Swedes Iron.....	75¢5¢75¢10¢
Swedes Iron, Upholsterers.....	75¢10¢75¢10¢5¢
Tinned Swedes Iron.....	75¢10¢75¢10¢5¢
Tinned Swedes Iron, Upholsterers.....	75¢10¢75¢10¢5¢
Gimp and Lace.....	75¢10¢75¢10¢5¢
Tinned Gimp and Lace.....	75¢10¢75¢10¢5¢
Swedes Iron Trimmers.....	75¢10¢75¢10¢5¢
Swedes Iron Miners.....	75¢10¢75¢10¢5¢
Swedes Iron Bill Posters or Railroad.....	75¢10¢75¢10¢5¢
Swedes Steel (Swedes Iron price list).....	80¢80¢5¢
Copper Tacks.....	50¢10¢
Copper Finishing, Trunk and Clout Nails.....	50¢10¢
Finishing Nails.....	70¢10¢70¢10¢10¢
Trunk and Clout Nails.....	70¢10¢70¢10¢10¢
Tinned Trunk and Clout Nails.....	70¢10¢
Basket Nails.....	70¢10¢70¢10¢10¢

Common and Patent Brads, 70¢10¢70¢	
Hungarian Nails.....	70¢10¢70¢10¢10¢
Chair Nails.....	70¢10¢70¢10¢10¢
Zinc Glaziers' Points.....	50¢50¢5¢
Cigar Box Nails.....	50¢10¢50¢10¢5¢
Picture Frame Points.....	50¢10¢50¢10¢5¢
Looking-Glass Tacks.....	50¢10¢50¢10¢5¢
Leathered Carpet.....	50¢10¢50¢10¢5¢
Brush Tacks.....	50¢10¢50¢10¢5¢
Shoe Finders, list Jan. 2, 1888.....	10¢10¢5¢
Lining and Saddle Nails, list Jan. 1, 1886.....	10¢10¢5¢

Tap Borers—	
Common and Rind.....	20¢10¢
Ive's Tap Borers.....	33¢4¢5¢
Enterprise Mfg. Co.....	20¢10¢30¢
Clark's.....	33¢4¢35¢

Tapes, Measuring—	
American.....	25¢10¢
Spring.....	40¢
Chesterman's, Regular list.....	25¢30¢

Thermometers—	
Tin Case.....	80¢80¢10¢

Thimble Skeins—See Skeins.	
Ties, Bale—Steel	
Standard Wire, list.....	50¢10¢5¢

Tinners' Shears, &c.—	
Shears and Snips (P. S. & W.).....	20¢25¢
Punches, see Punches.....	
Snips, J. Mallinson & Co.....	33¢4¢

Tinware—	
Stamped, Japanned and P'ced, list Jan. 20, 1887.....	75¢75¢5¢

Tire Benders, Upsetters, &c.—	
Stoddard's Lightning Tire Upsetters.....	15¢
Detroit Perfected Tire Bender.....	15¢

Tobacco Cutters—	
Champion.....	90¢10¢30¢
Wood Bottom.....	50¢ doz \$5.00 to \$5.25
All Iron.....	50¢ doz \$4.25
Nashua Lock Co's.....	50¢ doz \$18.00 to \$55¢
Wilson's.....	55¢
Sargent's.....	50¢ doz \$24.50 to \$10¢
Acme.....	50¢ doz \$20.00 to 40¢

Transom Lifters—	
Wollensak's.....	50¢
Class 3 and 4, Bronzed Iron.....	50¢
Class 3 and 4, Bronze Metal.....	25¢
Class 3 and 4, Brass.....	35¢
Skylight Lifters.....	35¢
Crown, Eagle and Shield.....	60¢
Reiter's, list Jan. 1, 1887.....	50¢10¢2¢
Bronzed Iron Rods.....	50¢10¢2¢
Brass, Real Bronze or Nickel Plate.....	30¢
Excelsior.....	50¢10¢2¢
Shaw's.....	50¢10¢
Payson's Universal.....	40¢40¢10¢

Traps—	
Game—	
Newhouse.....	35¢40¢5¢
Onelida Pattern.....	70¢70¢5¢
Game, Blake's Patent.....	40¢10¢5¢
House and Rat—	
Mouse Wood, Choker, 7 doz holes, 11 to 12¢	
Mouse, Round Wire.....	50¢ doz \$1.50, 10¢
Mouse, Cage Wire.....	50¢ doz \$2.50, 10¢
Mouse, Catch-em-alive.....	50¢ doz \$2.50, 10¢
Mouse, "Bonanza".....	50¢ doz \$1.00, 10¢
Mouse Delusion.....	50¢ doz \$1.50, 10¢
Rat, "Decoy".....	50¢ doz \$1.00, 10¢
Ideal.....	50¢ gr \$1.00, 10¢
Cyclone.....	50¢ gr \$1.00, 10¢
Hotchikiss Metallic Mouse, 5-hole traps.....	50¢ doz \$1.00, 10¢
In full cases.....	50¢ doz 75¢

Trowels—	
Lothrop's Brick and Plastering.....	25¢
Reed's Brick and Plastering.....	15¢
Disston's B. & K. and Plastering.....	25¢25¢10¢
Peace's Plastering.....	25¢
Clement & Maynard's.....	20¢
Rose's Brick.....	15¢20¢
Brad's Brick.....	25¢
Worrall's Brick and Plastering.....	20¢
Garden.....	70¢

Trucks, Warehouse, &c.—	
B. & L. Block Co's list, '88.....	40¢

Tubes, Boiler—	
See Pipe.....	

Twine—	
Flax Twine.....	BC. B.
No. 9, 14 and 18 B. Balls.....	22¢ 30¢
No. 12, 14 and 18 B. Balls.....	21¢ 29¢
No. 18, 24 and 36 B. Balls.....	18¢ 26¢
No. 24, 36 and 48 B. Balls.....	18¢ 26¢
No. 36, 48 and 72 B. Balls.....	16¢ 27¢
No. 254, Mattress, 14 and 18 B. Balls.....	48¢50¢
Chalk Line, Cotton, 1/2 B. Balls.....	25¢
Mason Line, Linen, 1/2 B. Balls.....	50¢
2-Ply Hemp, 1/4 and 1/2 B. Balls (Spring Twine).....	11¢
3-Ply Hemp, 1/4 B. Balls.....	12¢12¢4¢
3-Ply Hemp, 1/2 B. Balls.....	11¢11¢4¢
Cotton Wrapping, 5 Balls to lb.....	15¢10¢
2, 4 and 5-Ply Jute, 1/2 B. Balls.....	10¢
Wool.....	13¢14¢
Paper.....	13¢14¢
Cotton Mops, 6, 9, 12 and 15 lb to doz.....	18¢

Triers—	
Butter and cheese.....	25¢

Trunks, Warehouse, &c.—	</
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